LUCENT'S BIG PLAN Company lays out ambitious convergence scheme. Page 12.

EDI ALTERNATIVE Frank Moss' Bowstreet start-up has a new way for you to create e-commerce applications. Page 4.

The newsweekly of enterprise network computing

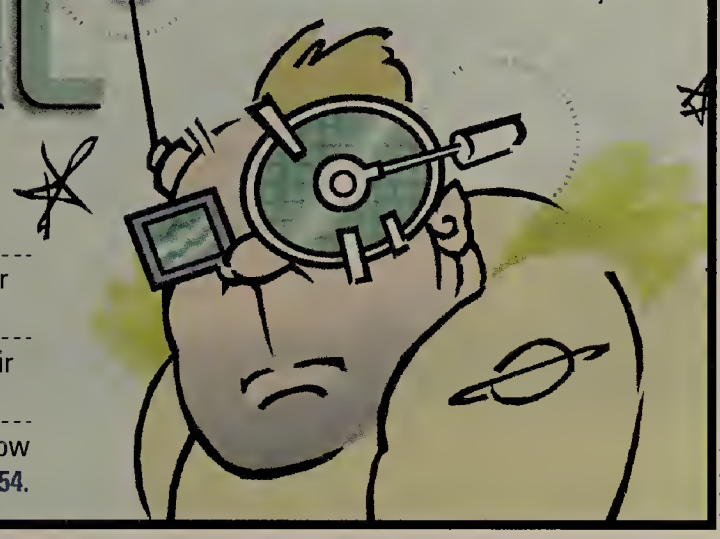
NetworkWorld

May 3, 1999 Volume 16, Number 18

The network portal: www.nwfusion.com

Networks OF THE FUTURE

What will your network look like 10 years from now? In our special report, we gather predictions from top thinkers in the industry.



THOMAS NORTON

Professional pundits list the top five trends affecting corporate networks. **Page 48.**

Strategists at major vendors reveal their long-range visions. **Page 50.**

Start-ups show what they've got on their drawing boards. **Page 52.**

Leading-edge corporate users reveal how they deal with technology shifts. **Page 54.**

Cisco pulls the plug on key WAN switch

Data giant shifts wide-area switching strategy.

BY JIM DUFFY

SAN JOSE — Cisco has quietly killed its prime offering for the core of enterprise and service provider WANs and has delayed delivery of another WAN switch by about a year.

The developments raise questions about Cisco's strategy for next-generation WAN switching and could cost the company business. Cisco users who were depending on these products will now have to put their plans on hold, opt for different Cisco gear, wait for the delayed products or choose another vendor's switch.

Cisco has halted development of the TGX 8750, an IP and ATM switch for service provider and enterprise WAN backbones. The TGX 8750 was announced at the ATM Year 98 show last June (*NW,* May 25, 1998, page 70).

See **Cisco**, page 80

AT&T's grand voice-over-cable plan

BY TIM GREENE

BOSTON — After coughing up more than $100 billion, AT&T says its cable TV buying binge is over.

From now on, AT&T will simply pursue joint ventures with cable operators to access their high-capacity local loops, says company CEO C. Michael Armstrong.

In fact, AT&T is already negotiating with cable giant Time-Warner on such a joint venture, Armstrong said last week at a forum of the Massachusetts Telecom Council.

AT&T's cable strategy moves the telecom firm away from its well-established circuit-switched roots. Armstrong is betting AT&T's future on IP voice and data over cable networks — technology that is unproven in large-scale rollouts.

"It's a bold move, but fortune favors the bold," says Howard Anderson, president of The Yankee Group in Boston.

AT&T hopes to wrap up its proposed $58 billion purchase of MediaOne later this year and launch a five-year rollout of local voice and data services

See **AT&T**, page 14

AT&T goes local

AT&T CEO C. Michael Armstrong last week spoke out on the impact of AT&T's cable network purchases.

STEVE BORNS

. . . AT&T's share of the local voice market will grow from nothing to 9% by 2005.

. . . 7% of local data customers will be AT&T's by 2005.

. . . the cable holdings will boost AT&T's annual revenue growth from about 6% to about 11%.

Who's got the best OS? Find out at NW Showdown

BY JOHN FONTANA

LAS VEGAS — Imagine that your various operating systems could really talk with one another while sitting together in your data center.

Would NetWare and Unix berate Windows 2000, the new kid on the rack? Would Kid 2000 fire off insults to the old stalwarts? And would Linux tell all three to stuff it in their closed-developer-community ears?

Might be fun to listen in, huh?

Well, the next best thing is happening next week at NetWorld+Interop 99 here. Technical experts from Microsoft, Novell, Sun, The Santa Cruz Operation and Red Hat Software will face questions from each other, audience members and a group of experts as part of Network World's

See **Showdown**, page 80

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MAY 3, 1999

THIS WEEK ONLINE

Online privacy. Network World columnist Ira Brodsky is getting tired of online privacy advocates: "You have no sacred right to privacy when using the 'Net. . . . When you surf the 'Net, you are out in public. If you do not want other people to know what you are doing, you should go somewhere private." Read the rest of his argument, then discuss it with him.
DocFinder: 2741

Remote access on the cheap. Last week, Help Desk columnist Ron Nutter made a couple of suggestions for a user seeking to set up a remote access system with little money. Readers responded with additional suggestions and alternatives.
DocFinder: 2742

Extranets. Signature Series Executive Editor Beth Schultz wonders how much business is being lost because extranet designers assume too much Web savvy from their end users: "The sales executive had the extranet URL and his password, but he couldn't get beyond the index page. Clicking on just about any link brought up an error message that he couldn't work around." See what happened.
DocFinder: 2743

Domain name registration. With competition coming to the field, some ISPs plan to bundle name registration with their core services. But what happens if you switch ISPs? Who owns the name? Some readers are getting concerned. Join our discussion.
DocFinder: 2744

How to get onto Network World Fusion

Click on Register on the home page and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Nonsubscribers must fill out an online registration form.

Table of Contents

Trade show guru Steve Miller says attending conferences is hard work and offers tips for boosting productivity. Page 63.

HOW TO CONTACT US

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FEATURES

Networks of the Future

Professional pundits list the top five trends affecting corporate networks. Page 48.

Strategists at major vendors reveal their long-range visions. Page 50.

Start-ups show what they've got on the drawing boards. Page 52.

Leading-edge corporate users reveal how they deal with technology shifts. Page 54.

REVIEW Visio Enterprise 5.0 bests two network diagramming competitors with reliable auto discovery and strong graphics.

REVIEW A combination e-mail router and help desk application, Aditi's Talisma 1.0 helps you get a handle on inbound e-mail queries.

NEWS BRIEFS, MAY 3, 1999

Lotus' Papows on the hot seat

Here's a quote from Oracle CEO Larry Ellison that's posted on the Lotus Web site: "'No nonsense' is the expression that comes to mind when I think of Jeff Papows.'" Ellison — and a lot of others — might be rethinking their assessment of the Lotus CEO after reading the *Wall Street Journal's* devastating portrait of Papows' alleged propensity for telling tall tales. Among the litany of dubious claims attributed to Papows in the April 29 article:

- That he attained the rank of Marine captain, instead of his rightful first lieutenant.
- That he received a doctoral degree from Pepperdine University, instead of the mail-order college that actually granted it.
- That he had been orphaned as a child, which would be news to his parents, who live in Massachusetts.

In the story, Papows denied many of the accounts outright and attributed others to misunderstandings and his failure to manage "water-cooler legend" that has sprung up around him. He wasn't granting interviews late last week, nor was there any statement forthcoming from Lotus' parent company IBM. "We view the story as an aggregation of rumors and commentary on those rumors," says Brian Simmons, vice president of worldwide communications at Lotus. "We're proceeding with business as usual."

Nortel's House has nightmares

Nortel Networks may be brimming with confidence as the integration of Bay Networks progresses apparently with little incident, but the company's president, David House, still has something on his mind: Cisco. "If you ask me for my nightmare, [Cisco] would buy Siemens' telephony business," said House at a recent meeting of journalists in Asia. House said Cisco is missing vital telecommunications experience in its portfolio and may be on the hunt. In the fine tradition of commenting on competitors' problems, House said the challenge for Cisco is that widespread use of IP network technologies will dissolve Cisco's points of differentiation. "Cisco has got to get more competitive," House says. Naturally, House refused to disclose Nortel's own acquisition plans for the future.

Nortel's House fears Cisco buying Siemen's telephony group.

VPN mania

Catch a ringside seat for the biggest virtual private network (VPN) blowout of the 20th century at NetWorld+Interop 99 in Las Vegas next week. Network World Test Alliance partner Joel Snyder has assembled more than a dozen VPN vendors to participate in a four-day interoperability demonstration as part of the show's InteropNet network showcase. Cisco, Check Point Software, Intel, Internet Dynamics, Microsoft, Nortel Networks and Radguard will all test how their implementations of VPN technologies, such as IP Security, Point-to-Point Tunneling Protocol and Layer 2 Tunneling Protocol, work — or maybe don't work — with those of their counterparts. The demonstration will run Monday through Thursday, 9 a.m. to 5:30 p.m. in the main lobby of the Las Vegas convention center.

Industry giants battle over MediaOne

In a battle of titans, Microsoft and America Online are now grappling with AT&T and ComCast for ownership of cable TV provider MediaOne. Possible bid amounts were unavailable at press time. Microsoft and AOL last week took steps that would let them put in bids of their own for MediaOne. Microsoft has already shown interest in cable TV as a way for customers to get fast Internet access by investing $1 billion in ComCast last year. MediaOne has already attracted buyout offers from ComCast ($48 billion) and AT&T ($58 billion). AT&T wants MediaOne's cable TV networks to provide local voice and data services as well as entertainment.

AT&T late to the DSL game

AT&T threw its hat into the digital subscriber line (DSL) service ring last week when it announced a five-city trial of the high-speed technology. AT&T says it will have 1,200 Internet points of presence equipped with DSL gear over the next year. AT&T is in the process of acquiring many of those POPs via its planned IBM Global Services acquisition. That deal is expected to close by the end of June. IBM Global Services has been running a four-city DSL trial since October. Most of AT&T's competitors, such as MCI Worldcom's UUNET, already offer DSL services.

Internet2 funding rolls in

Microsoft last week said it will contribute about $1 million in products, money and research to the Internet2 project, while IBM awarded $1.9 million in research grants to three universities as part of its ongoing development of the next-generation Internet. IBM has already given $5.6 million to the undertaking. More than 150 universities and about 50 corporations are collaborating in the 30-month-old project to develop advanced network services and technologies. In February, the project leaders announced the completion of a high-speed, coast-to-coast fiber-optic network called Abilene that will act as the backbone for sharing Internet research.

Start-up aims to make e-commerce easy

Bowstreet to combine directory, XML technologies.

BY ROBIN SCHREIER HOHMAN

PORTSMOUTH, N.H. — Start-up Bowstreet Software this week will unveil plans to build a framework that will make it easier, faster and less expensive for users to create business-to-business applications over the Internet.

The framework will let clientele build customized e-commerce applications on the fly, instead of hard-coding programs for each business partner.

Ex-Tivoli CEO Frank Moss now heads up Bowstreet.

Potential cost savings

By using a directory such as Novell Directory Services, along with the Extensible Markup Language (XML), disparate systems can be pulled together to easily build applications, without the usual associated technical expertise, personnel and expense of today's electronic data interchange applications. XML provides a standard language for formatting Web data.

as financing, prices, inventory and credit check — needed to make a sale. The Bowstreet framework would gather all the information and present it back to the customer on a single screen.

"Bowstreet is using a directory exactly as it should be used, by relying on the directory for the functions instead of the user building them," says Jamie Lewis, president of The Burton Group. The framework creates an execution environment that does all the work, he says.

For users, the real power in the framework comes from being able to reuse Bowstreet code, business processes and user information for multiple applications. By reusing that information, applications can be developed less expensively for many different business partners.

Early summer release

Bowstreet is partnering with Novell and IBM, and expects to ship products in early summer. Company officials declined to give more specific information about the package. Bowstreet is headed by Chairman Frank Moss, former CEO and chairman of Tivoli Systems. ◪

> ***"Bowstreet is using a directory exactly as it should be used, by relying on the directory for the functions instead of the user building them."***
>
> Jamie Lewis, president, The Burton Group

A customer might log on to a system running the Bowstreet framework to buy a car. Using the directory, the Bowstreet server would first authenticate the customer then access the other distributed back-end systems — such


IBM
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Job Description:
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Experience:
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IBM rethinks server sales strategy

Big Blue considers flexible methods of selling its machines and related services.

BY MARC SONGINI

PALISADES, N.Y. — IBM is contemplating a new way of selling its servers and related services.

During an analyst briefing last week, IBM executives unveiled a possible sales model under which customers could pay more or less for servers based on various factors — such as how many Web site hits the machines could handle per day or month. And IBM could back up its hardware with some sort of service-level agreements.

This sales model would differ from the typical server sales scheme, which involves paying the list price or negotiating for a discount.

IBM declined to provide specifics on its plan but did offer some insight into how the sales approach could work.

Say, for instance, a user purchased an RS/6000 server to host a Web site. The user could agree to pay IBM a certain amount based on IBM's promise that the machine could handle one million Web site hits per day. IBM service and support could be included as part of the package.

If the server failed to meet the agreed-upon level, IBM would upgrade the box, adding memory, disk space, processors or whatever was needed to make the machine meet the customer's needs. If the customer eventually needed the server to handle more than one million hits per day, the customer could pay extra to have the server upgraded.

IBM could also offer flexible pricing — charging customers based on the number of users accessing a server, or other ways.

Some analysts were intrigued. Frank Dzubeck, president of Communications Network Architects in Washington, D.C., says new sales options such as these could be good news for companies on fixed budgets.

Another analyst, John Dunkle of Workgroup Strategic in Portsmouth, N.H., expects IBM to adopt the new sales approach to complement — not replace — its current sales model.

IBM has a new 24-processor RS/6000 on the way.

One RS/6000 user doing Web site hosting had some reservations about the new model, fearing that IBM could use the sales approach as a tool to charge users more for products than the company can get under its current licensing model.

The user, who asked not to be named, argues that there would be no way to come up with a fixed level of service for IBM products, given that customers constantly tweak the software on their servers.

RS/6000 box coming

IBM last week also previewed a new version of the RS/6000, called the S80, that scales from eight to 24 processors, providing mainframe-like performance. Its predecessor, the S70A, scales to 12 chips. The S80 should attract companies that need a machine that can handle up to 100,000 Web transactions per minute, or double to triple current S70A performance. The server will be available in the fourth quarter. Pricing was to be determined.

IBM confirmed plans for the server but declined to comment further. ◪

Concentric circles QoS service market

Business users to have more control over virtual private network traffic.

BY DENISE PAPPALARDO

SAN JOSE — Concentric Network is rolling out a new service that gives business users more control over their Internet-bound traffic.

The ISP this week is introducing its ConcentricQoS service, which lets virtual private network (VPN) users set up bandwidth usage parameters on each of their dedicated links.

John Lawler, VPN product line manager, highlights ConcentricQoS' ability to set priority levels.

Most VPN services today have users blindly sending traffic over their networks not knowing if mission-critical traffic will get dropped due to congestion.

ConcentricQoS lets users set up priority levels based on IP address, application type or URL, and does so using Xedia's Access Point QVPN router, says John Lawler, VPN product line manager at Concentric. The QVPN router includes bandwidth management technology such as class-based queuing (CBQ), which lets users divvy up their dedicated T-1 links to ensure bandwidth-hungry applications get handled without major delays.

"Performance is what users care about when it comes to VPN services," says Eric Zines, senior consultant at TeleChoice, an industry consulting firm in Boston. Concentric is giving users more control over traffic than any other VPN service offers, he claims.

But ConcentricQoS also has its limitations because the QVPN box controls bandwidth only from the customer's premises to Concentric's network. Concentric's offering is touted as a VPN service, but the bandwidth management features are not being supported from end to end on a customer's VPN. If a customer sets his bandwidth management policies to always give video traffic the most bandwidth, that priority is not carried throughout Concentric's network.

While Concentric is not the first ISP to team with Xedia, it is the first to offer a 24-7 managed VPN service based on the vendor's products.

Last year, MCI WorldCom's UUNET announced its Access Optimization Service, which couples Xedia's Access Point 45 device with a dedicated 45M bit/sec Internet access connection. UUNET's service is for straight Internet access and lets users shape their bandwidth using CBQ. ConcentricQoS, on the other hand, is a fully managed service designed for VPNs.

ConcentricQoS is slated for availability in June for $600 per month per site. This monthly charge is in addition to Concentric users' monthly dedicated T-1 rates, which start at $1,400 per month.

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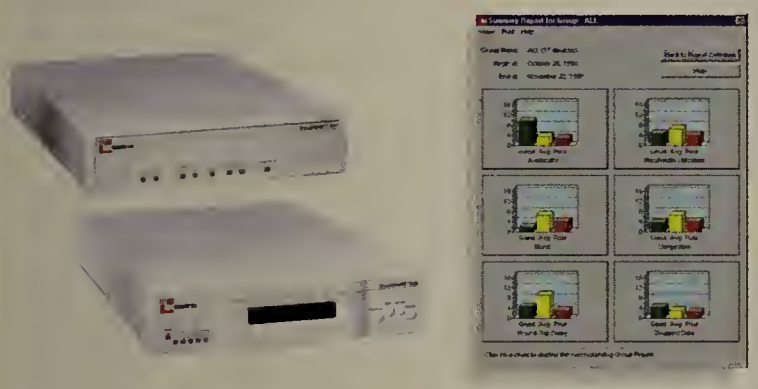

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Hacker-thwarting tools to abound at N+I show

BY ELLEN MESSMER

LAS VEGAS — Security vendors want to make the world a safer place by giving you a way to shoot down hostile applets or patrol your net for vulnerabilities.

At NetWorld+Interop 99, L3 Communications Network Security Systems, a vendor that until now has sold mainly into the military market, will debut the Retriever LAN security probe. The product can analyze network nodes and services and report back on security holes.

"You can schedule Retriever to do daily checks," says Ken Berry, L3's director of product marketing. "It uses methods such as Ping, SNMP, and port scanning on your network operating systems and firewalls. It could tell you if someone added a device or changed the services on the network."

The Retriever security tool will report back on the number of vulnerabilities you have and how to fix them, he says. It works on any kind of LAN, and L3 is pricing licenses for the tool according to the size of the network. For instance, it costs $500 per Class C address block.

NETWORLD+INTEROP 99

Also at Interop, Internet Security Systems (ISS) will announce upgrades for two of its products, Internet Scanner and Database Scanner.

"The upgrades in both are related to managing information risk in an electronic commerce environment," says Patrick Taylor, ISS vice president of strategic marketing. Specifically, Internet Scanner 5.8 will add a way to detect security vulnerabilities in certain Web applications, including ones built using Allaire's Cold Fusion application-development product, in which security vulnerabilities were identified recently.

"We've also added a lot of new Unix checks, and a capability called Flex-Check to ensure certain directory files can be read by only a limited group of people," Taylor says.

Database Scanner 2.1 will add support for Microsoft SQL Server 7, allowing the ISS tool to monitor unauthorized attempts at object access or stored procedure use.

Another security product being introduced at Interop is designed to block hostile Java or ActiveX applets that might do damage to files after users inadvertently download them from the Web into an intranet.

Finjan Software, Inc. will introduce SurfinShield Corporate 4.0, desktop software that works with the user's browser to block ActiveX or Java code. The new version can prevent a hostile Web-based applet from copying or erasing a person's Microsoft Office files. "We call this Auto-Launch Blocking, and the policy determined by the security manager can determine where this feature is used," says Bill Lyons, Finjan's president and CEO. Expected to ship in June, SurfinShield Corporate 4.0 will cost about $128 per user.

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FORE gets snapped up

GEC, overseas firm, buys U.S. data net player.

BY JEFF CARUSO

PITTSBURGH — Yet another U.S. enterprise data network firm was swallowed by an overseas telecom company last week, when London-based GEC agreed to buy FORE Systems.

Industry watchers say the $4.5 billion acquisition is likely to have little impact on FORE's enterprise customers because FORE will operate as a wholly owned subsidiary and continue to develop enterprise network hardware.

General Electric Company (GEC) bought FORE in part to apply FORE's ATM and IP switching technology to service provider gear. Currently, about 30% of FORE's business is with service providers.

The acquisition follows other moves in recent months by European telecom vendors, including Alcatel, Ericsson, Nokia and Siemens (see graphic). These vendors are also looking to gain a foothold in the U.S. market (*NW,* March 8, page 1).

Founded in 1990, FORE has built its reputation on ATM switches. Over the past few years, ATM to the desktop began to lose favor and ATM in the enterprise backbone started to see competition from Gigabit Ethernet. FORE adapted its strategy to a hybrid of ATM and Ethernet, and last year bought routing switch maker Berkeley Networks. However, FORE lost $207 million in its last fiscal year, on revenue of $632 million.

FORE was looking for a buyer in part to remove doubts about the company's future, acknowledges Donal Byrne, senior vice president of corporate marketing at FORE.

Rumors that FORE would be bought have been flying around for years.

"I expected it would happen at some point," says Jon Scarbrough, director of instructional technology at Oakton Community College in Des Plaines, Ill. Scarbrough uses FORE equipment on Oakton's campus and recently helped implement FORE gear in a WAN around Chicago.

GEC has a background in developing defense electronics, but it has moved into telecommunications transmission and access products with its Marconi Communications subsidiary. GEC made about $1.8 billion in profits in its 1998 fiscal year, on revenue of $18 billion.

Though GEC lends financial stability to FORE, the combined company still faces a formidable challenge in that GEC is relatively unknown in the U.S., says Mike McConnell, director of enterprise management and LAN programs at Infonetics Research in San Jose. "It's not perceived as a player," he says. "Is it really serious? Is it going to be able to execute?"

The service provider portion of FORE's business is likely to grow substantially once GEC owns FORE, says Esmeralda Silva, an analyst at International Data Corp., in Framingham, Mass. "But it can't happen overnight," she says.

GEC in March bought Cleveland-based Reltec for $2.1 billion to break into the U.S. market. Reltec makes broadband access equipment for carriers.

Byrne acknowledges that GEC is unknown, but says that will change. "Give us about a year, and GEC will be on the tip of everyone's tongue," he says. ◪

Buyouts from abroad

GEC's $4.5 billion acquisition of FORE is another in a line of recent buyouts of U.S. data network companies by European communications firms.

Company	Traditional market	Purchase/cost	Target markets
Alcatel	Carrier phone switches	Assured Access/$350 million, Packet Engines/$315 million, Xylan/$2 billion	Enterprise customers and packet voice
Ericsson	Wired and wireless phone gear	ACC/$285 million, Torrent/$450 million	Packet voice, ISP networks
Nokia	Wired and wireless phone gear	Diamond Lane/$125 million, Ipsilon/ $120 million	Digital access, packet voice
Siemens	Carrier phone switches, PBXs	Argon/$240 million, Castle/$300 million	Packet voice

Compaq airs powerful Himalaya server

BY DENI CONNOR

Compaq next month will roll out its most powerful server to date, a machine designed to handle transaction-intensive applications for Internet commerce and decision support.

Compaq says the new NonStop Himalaya S72000, which boasts four, eight or 16 64-bit MIPS processors, performs 20% faster than the company's current high-end offering, the S70000.

The new server, based on technology obtained via Compaq's acquisition of Tandem, costs the same as the S70000. Compaq officials say the S70000 is likely to fade away.

"We would go with the S72000 because of its price and performance enhancements," says Ryan Smith, Tandem systems and support manager for Intermountain Health Care in Salt Lake City.

While the new server will initially use MIPS processors, Compaq next year plans to offer customers the chance to upgrade to Alpha processors, which Compaq obtained via its Digital acquisition. However, it's unclear whether Compaq customers will be able to just swap in an Alpha board or whether Compaq will provide a separate Alpha chassis that would link to the S72000.

The S72000 is 20% faster than Compaq's current high-end box.

Stephen Meer, chief technology officer at 911 emergency services provider SCC Communications, says he's confident Compaq will make the Alpha migration fairly uncomplicated.

"Over the years, Tandem has built excellent tools for recompiling applications and accelerating adoption of new platforms," he says. Meer previously moved from Complex Instruction Set Computing-based to Reduced Instruction Set Computing-based Tandem machines.

Customers will be able to link S72000s to form clusters with more than 4,000 200-MHz R10000 MIPS processors. Each processor boasts 4M bytes of Level 2 cache memory and 2G bytes of main memory. Main memory management functions have been moved from the server's CPUs to other processors, in order to free up the CPUs for data processing. The S72000 can handle up to 3 petabytes of storage.

The S72000 ships with a NonStop SQL database engine, NonStop Storage Management Foundation (SMF) and several other data collection and management tools. The server runs a variant of Unix, and its pricing starts at less than $200,000.

Compaq plans to release at least two more MIPS-based S-class servers this year before delivering out-of-the-box Alpha EV7-based servers in 2000.

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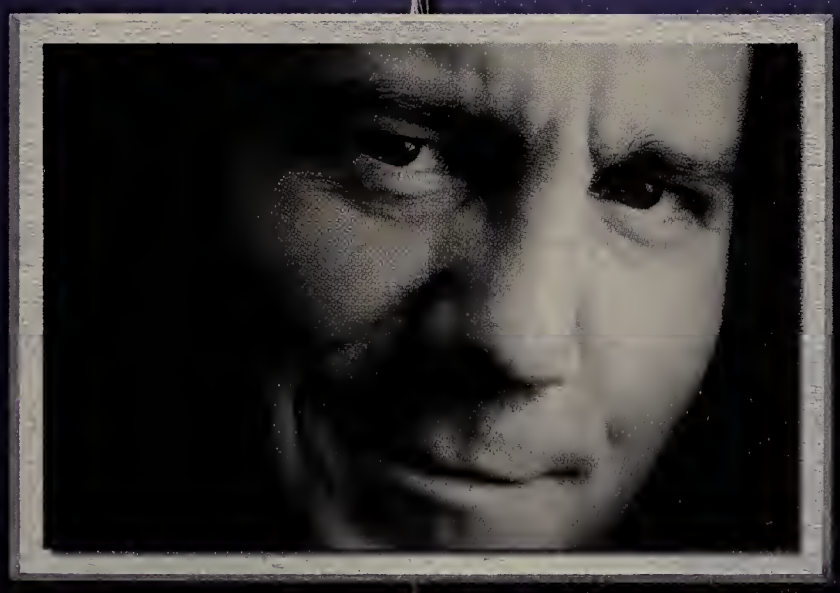

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Lucent's lays out its voice-over-IP roadmap

Nine-product interoperability scheme includes new support for queuing and other standards.

BY DAVID ROHDE

MURRAY HILL, N.J. — Picture your IP-enabled PBX acting as a LAN-based call-control server passing voice streams to a Gigabit Ethernet switch and then out over an IP virtual private network.

Now you have part of the vision laid out in Lucent's new voice-over-IP roadmap, to be unveiled today and demonstrated next week at the NetWorld+Interop 99 trade show in Las Vegas.

Lucent's voice-over-IP plan involves nine products, and for the first time, combines the firm's voice and data enterprise offerings under a unified architecture.

But don't worry, Lucent officials say, you don't need all nine products to achieve convergence, and they don't all have to be from Lucent. You can use Cisco Catalyst Ethernet switches, for example, or other vendors' PBXs, as long as they support certain telecom industry standards.

The Lucent roadmap spells out how enterprises can ensure that packetized voice doesn't break down in LANs or WANs, says Tom Nolle, president of CIMI Corp., a technology-assessment firm in Voorhees, N.J.

But he cautions that such integrated environments are best-suited for businesses with high-value knowledge workers who might benefit from linking their voice and data applications. "A branch bank is a poor place for this," Nolle says.

Lucent's roadmap begins with the next software release of the company's Cajun family of Ethernet 10/100M and gigabit switches. That release will complete support across the product family for 802.1p, a standard that defines how Ethernet traffic can be prioritized into eight queues, so that voice and other delay-sensitive applications can pass through ahead of other traffic.

But Lucent will also be adding an extension to 802.1p that will force networks to drop voice packets that make it through the queues but arrive so late that they disrupt call quality. Such packets are "better never than late," says Stephen Price, Lucent's business and strategy director for IP Communications.

The 802.1p extension will improve voice quality, but Lucent says its voice-over-IP products will still interoperate with Cisco's Catalyst switches and other standard 802.1p-compatible Ethernet switching products.

Lucent will offer two alternatives to a traditional PBX to feed voice into these Ethernet switched environments, both of them previously announced but not yet generally available.

One alternative, Definity IP Solutions, is a hardware and software upgrade to Lucent's flagship Definity PBX system, which supports either Ethernet-attached phones or "soft phones" — desktop PC graphical user interfaces that emulate business-phone features. As a result, either the phone itself or the desktop PC becomes the Ethernet endpoint of the entire voice-over-IP system.

The other PBX alternative, Lucent's IP Exchange, is a new LAN-based call control server — sometimes referred to as "unPBX" — that supports LAN-attached phones and is designed for environments that don't currently have phone systems.

This week's announcement from Lucent will also formalize the company's gradual move away from a proprietary method of linking dispersed Definity PBXs within an enterprise so all users can share conferencing features, caller ID, voice mail and other capabilities. Lucent will accomplish this by embracing Q.Sig, a standard popular in Europe, to link multiple vendors' PBXs while retaining feature transparency.

Lucent has decided to support Q.Sig because many U.S.-based multinational companies that have standardized on Definity models in the U.S. still have other PBX vendors in Europe, where Lucent's presence is comparatively weak.

To control the entire IP-based architecture, Lucent will offer a policy management server called RealNet Rules Enterprise Policy Manager, which will regulate quality of service and security, Price says.

Lucent officials say the company's roadmap is designed to show how the company's multifaceted enterprise product portfolio fits together to support an integrated IP future. That future, however, is not simply about saving money.

"In briefings I give to corporate customers, half the time they have concluded that they wouldn't save any money [with voice over IP] because of the aggressive numbers they're getting from their carriers," says Kathy Meier, Lucent's general manager for IP communications.

Longer term, however, economics will drive the acceptance of voice over IP, she says.

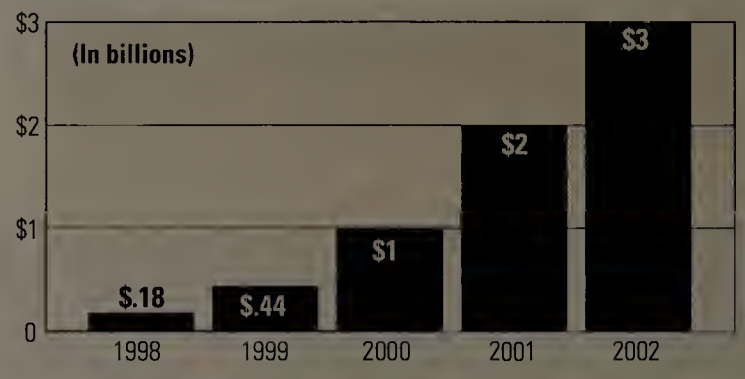
Some of Lucent's products are available immediately; others will be rolled out through the summer of 2000.

"The phasing of Lucent's product rollout does not bother me a bit," says Nolle. "Nobody's going to buy all this stuff in 1999." ◪

Invited to the party

Lucent wants to grab its share of what is expected to be a steadily growing voice-over-IP market:

Projected expenditures on voice-over-IP equipment by large U.S. companies (more than 1,000 employees)



SOURCE: INFONETICS RESEARCH, SAN JOSE

Novell to embed directory code in Texas Instruments' integrated circuits

The tiny directory will show up in cell phones and other handhelds.

BY ROBIN SCHREIER HOHMAN

DALLAS — Novell is teaming with Texas Instruments to put a tiny version of its directory on Texas Instruments' new integrated circuits for small appliances, such as cell phones and handheld devices.

The idea is to let users more easily share information across a variety of devices and link to any Novell Network Directory Services (NDS) environment, says Michael Simpson, director of strategic market planning at Novell.

For example, a user could change a phone number in a cell phone's address book, and then update a personal digital assistant and groupware address books.

The embedded directory will be able to manage the identity of the device, who's accessing it, and how it interacts with other devices.

Uniting directories and DSPs

The directory will be embedded into Texas Instruments' new Digital Thunder digital signal processing (DSP) boards, which were announced last week. Digital Thunder combines the circuit boards with a development platform for third-party application vendors.

To fit on a DSP board, the NDS code has been boiled down to 7K, Simpson says. Anything larger than that won't fit, he says.

The embedded directory will be compatible with earlier versions of NDS. The DSP boards are already shipping with the Novell directory. Novell expects to have shipping information for developers by year-end. Products implementing the chips should debut in early 2000. ◪

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Frontier gives e-mail appliance a plug

Service provider to base outsourcing service on Mirapoint box.

BY PAUL MCNAMARA

CUPERTINO, CALIF. — E-mail customers mulling over the move to an outsourced service or the in-house use of a single-purpose server "appliance" might find both in a new offering from Mirapoint and Frontier Communications.

NETWORLD+INTEROP 99

Next week at NetWorld+ Interop 99 in Las Vegas, messaging start-up Mirapoint will announce that Frontier will soon be using Mirapoint's M100 and M1000 thin servers to host business e-mail. A company will be able to choose between having the Mirapoint appliance located on its own site or hosted at one of Frontier's facilities.

Customer-site appliances will be backed up by Frontier over its network. Customers choosing the Frontier-hosted option will get a dedicated machine and be able to administer their end-user accounts through a Web browser interface. Mirapoint also sells the servers for direct enterprise deployment.

Early Mirapoint customers and industry analysts say the mix-and-match use of these e-mail appliances and outsourced services will appeal to customers whose e-mail needs are relatively basic.

"We're using [Mirapoint's box] not only for our own corporate enterprise use, but also for hosting e-mail for our customers," says General Grant, division manager at GSAT-Datacom, a service provider in Bay City, Mich. "Not only does the box perform very well, but Mirapoint's support has just been incredible."

Sharing that assessment is Dave Van Allen, CEO of FastNet, a data communications provider in Bethlehem, Pa. His company is also using the M1000 internally and as a platform for outsourcing.

"Just like any 1.0 product, Mirapoint's server needed to go back for some fine-tuning," Van Allen says. "The most impressive part was that it actually came back to us fine-tuned."

The M100 and M1000 thin servers come loaded with standards-based e-mail software and can be up and running in only 10 minutes, the company claims.

Designed for corporations with up to 5,000 workers and ISPs with fewer than 100,000 accounts, the devices can be used with any e-mail client that supports Internet Message Access Protocol 4 or Post Office Protocol 3.

The software runs on an embedded proprietary operating system designed specifically for e-mail. Mirapoint claims this function-specific approach makes the devices more reliable, scalable and manageable than established messaging systems that run on Windows NT or Unix servers.

One industry analyst, Tim Sloane of Boston-based Aberdeen Group, believes Mirapoint may have a difficult time selling corporate users and e-mail outsourcers on its vision.

"Some well-managed organizations will determine they can save money and use an e-mail appliance, while the majority of users will not even investigate the option or question what they pay today," Sloane says. "If a company knows what it spends, I'll bet the Mirapoint product looks pretty good."

Frontier's outsourcing prices will be based on usage, with costs averaging less than $100 per user per year. The M100 costs about $15,000 and includes a 300-user license, while the M1000 is priced at roughly $26,000 with an unlimited user license.

Mirapoint: (408) 517-1300

PROFILE: MIRAPOINT

STARTUP

Based:	Cupertino, Calif.
Founded:	August 1997; privately held
Investors:	Andy Bechtolscheim, vice president of technology, Cisco, Amit Shah, founder and CEO, Pipelinks
Main products:	M100 and M1000 thin servers
Executives:	Satish Ramachandran, founder, president and CEO Albert Benhamou, vice president of European operations
Web address:	www.mirapoint.com

AT&T,
continued from page 1

over cable infrastructure, Armstrong says (*NW*, April 19, page 7).

Microsoft, America Online and Comcast are now also interested in MediaOne (see News Briefs, page 4).

Using networks AT&T owns outright, the company can reach only 27% of all U.S. customers. That is why joint ventures with other cable operators will be key, Anderson says.

As part of such ventures, AT&T is offering to upgrade cable operator's networks so they can carry voice and data. AT&T then plans to share the profits that come in from those new services, according to Anderson.

In a joint ventures, companies create a separate business entity, with each partner owning a portion. Majority ownership in such ventures — not simple alliances — is important to Armstrong.

"Owning facilities is the only way to control your own destiny," Armstrong says. "You can't rely on competitors for your network architecture, ordering and facilities."

AT&T has already acquired cable operator Tele-Communications, Inc. ($48 billion) and Teleport Communications Group ($11.3 billion), a local access firm whose network is based on cable. The addition of MediaOne will give AT&T the size to successfully negotiate the joint ventures and to compete against regional Bell operating companies.

"It's a bold move, but fortune favors the bold."

Howard Anderson, president, The Yankee Group

"[Our size will] allow us to go on the offense after the local exchange carriers," Armstrong says.

While cable networks cater mainly to residential customers, Armstrong is eyeing business customers. He says AT&T is investing in gear that can deliver IP, frame relay, ATM and other services that businesses typically want over these new networks.

The AT&T plan to run IP voice over cable depends on equipment still being developed, Armstrong acknowledges.

Once the equipment is

ready to deploy sometime late next year, IP voice over cable will cut the cost of gear from $750 per customer for circuit-switched connections to $300 to $500 per customer. The lower cost to set up the voice services will let AT&T offer additional phone lines with distinctive rings at a few dollars each, undercutting RBOC rates of $15 to $20 per month.

Because the IP voice gear isn't ready yet, AT&T is trialing voice-over-cable service in Freemont, Calif., using circuit-switched equipment. The trial is designed to iron out kinks in the ordering, provisioning, maintenance and billing of local voice services before extending the trial to paying customers in the third quarter.

The paying trials will be expanded to seven or eight other cities by year-end and then extended gradually through 2000 and 2001, Armstrong says. AT&T can't try a local services sales blitz right away because the company doesn't have enough people to handle the flood of new customers it might get.

Short term, AT&T will rely on reselling phone service from RBOCs to reach the customers it cannot reach directly on its cable networks or via AT&T's fixed PCS wireless network. The PCS network can provide up to four phone lines and a personal T-1 per customer.

More coverage of AT&T. Page 16.

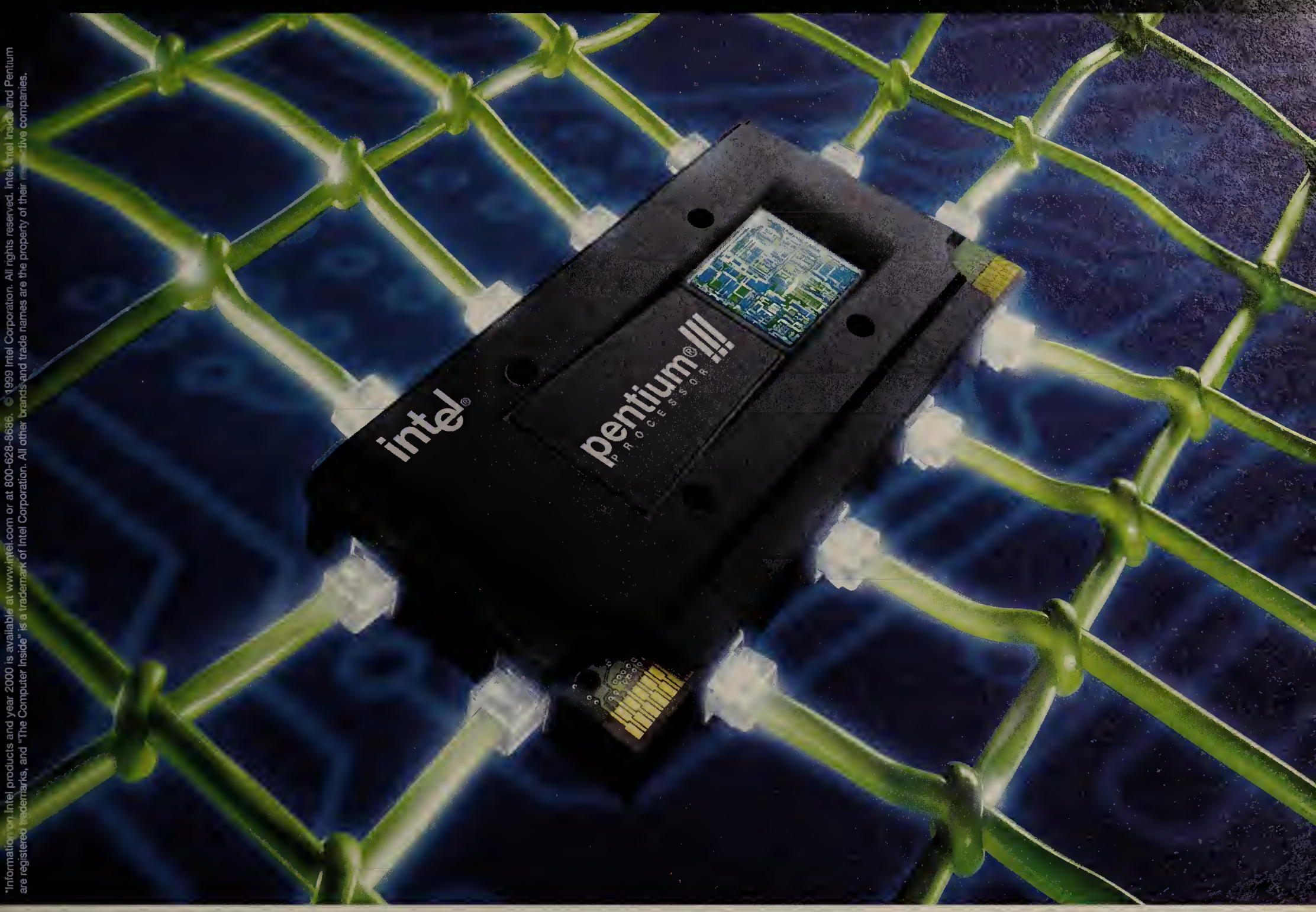
In shifting focus to the local market, Armstrong is facing a new reality: long-distance competition is only getting stiffer.

Each year 25% of long-distance customers switch their long-distance carrier. And profits from long distance will decline as prices drop.

With cable networks in its pocket, AT&T can offer more than just cheaper and cheaper phone service. The company can offer entertainment, Internet access and phone service to hang onto residential customers. "AT&T is saying, 'I need three options to get into that home,' " Anderson says.

Armstrong says AT&T will continue to push RBOCs to streamline ordering systems so customers can easily switch their local services.

Is your e-business walking a tightrope?



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Sun release makes Java run faster

Long-anticipated products should boost Java's performance in enterprise networks.

BY JOHN COX

PARIS — The long-awaited Java products released last week by Sun should bolster the company's claims that Java is ready, at last, to play a major role in enterprise networks.

At the Java Enterprise Solutions Symposium here, Sun released the oft-delayed HotSpot Performance Engine, which makes Java code run faster. Also released was i-Planet, which lets any Java browser on any client device access files and applications on enterprise servers.

In addition, Sun demonstrated how its Jini connection software works with software agents built with the Java Dynamic Management Kit. A third-party management console was able to quickly find and control new PCs, printers, digital cameras and other devices as they were plugged into the network.

These releases come just a few months after the company introduced Java2, the latest version of Sun's core Java software components. Java2 has been widely hailed by application developers as providing better performance and much needed new functions.

"By the summer, all applications we build for our customers will be [built] with Java2," says Frank Greco, CEO of Crossroads Technology, a New York software developer for financial services companies.

HotSpot should end any lingering reservations about Java's performance, according to Sun executives. "We feel we've licked the performance problem," says Jon Kannegaard, vice president of Sun's Java Software group. Sun claims HotSpot executes Java two times faster than is possible today with the Java2 software alone.

"The performance increase for Java in the last three years is a factor of almost 40. We feel [that with the HotSpot Performance Engine] we've licked the performance problem."

Jon Kannegaard, vice president, Sun

Greco says his company is evaluating HotSpot for use on all current and future products. But even without HotSpot, Java performance has not been a problem. "We have not yet had a customer who has complained about overall Java performance," he says.

The i-Planet software, based in part on a product from the i-Planet acquisition made recently by Sun, lets remote browser users interact directly with corporate files and applications via an encrypted connection, regardless of the underlying operating system.

"We let you, from your browser, remotely execute applications on any server," claims Stuart Wells, vice president of Sun's network software products group. "You don't have to modify or remove your corporate firewall." ◪

AT&T wheels and deals while global competitors stress services

Equant expands voice/data convergence service, questions how long new ventures will take to bear fruit.

BY DAVID ROHDE

The big carrier game of international musical chairs fell into a familiar pattern last week: Giant players announced complicated new partnerships while smaller players with existing global networks touted services available now.

Deal-mad AT&T made the biggest impact, entering into two new partnerships and getting rid of another in its ongoing attempt to build a true global network instead of a patchwork of interconnections.

Fresh from its domestic cable TV buying spree, AT&T, together with partner British Telecommunications, took a 30% equity stake in Japan Telecom, an alternative carrier that has emphasized IP transport. (For more on AT&T's actions last week, see related story, page 1.) At the same time, AT&T inked a deal with NTT — Japan's dominant player and the world's largest carrier — to collaborate on service and support for multinational corporations.

The NTT deal connects the dots among several relationships in AT&T's drive for a seamless global network. In 1997, NTT began offering international services — until then the nearly exclusive province of yet another Japanese carrier — under the trade name Arcstar. Arcstar established points of presence throughout Asia but needed much greater global coverage, so it interconnected with the 850-POP IBM Global Network. As it happens, AT&T is now buying the IBM net.

The new agreement will ensure that NTT's Japanese-based multinationals will be able to use what will shortly become AT&T's global network, says Rick Roscitt, president of AT&T Solutions, the carrier's managed-services and outsourcing unit.

In addition, NTT and AT&T Solutions will work to unify their customer support and professional-services platforms, possibly leading to a single global offering for carrier-managed networks.

Rounding out the agreement will be Japan Telecom's ISP, which will merge with AT&T's and BT's Japanese ISPs to form one of Japan's top five ISPs, with more than 400,000 customers.

"We had no choice [but to sell AT&T-Unisource] given that we decided to proceed with a single, unified network."

Rick Roscitt, president, AT&T Solutions

But the moves come with a consequence: AT&T decided to sell an older European venture, known as AT&T-Unisource Communications, to veteran global network provider Infonet Services Corp. AT&T-Unisource is an alliance-based voice and data provider based on carrier-network handoffs, which AT&T CEO C. Michael Armstrong has repeatedly said are inferior to a single global network owned by the same carrier or joint venture.

"We had no choice, given that we decided to proceed with a single, unified network," Roscitt says. "That put the Unisource agreement in jeopardy."

Other network providers who are fighting against the internationally famous AT&T brand name say they're unimpressed with AT&T's global chess game.

For example, Equant — a service provider whose global network includes uniform implementations of Nortel frame relay/ATM switching equipment — last week said it was expanding its so-called iVAD convergence service to Hungary, Ukraine and Martinique, to bring its total to 44 countries.

The iVAD service, which stands for "integrated voice and data," involves placing a Cisco MC3810 multiservice access device on all customer premises to carry intracompany voice traffic over preexisting frame relay data links.

Equant officials challenged AT&T to complete the integration of its global deals and come out with a similar service.

"It could take years," says Equant Executive Vice President Laurence Huntley. "You're talking about support on the ground, billing integration and cultural differences."

Analysts agreed. "Companies like Equant that own rather than partner have an advantage," says Jeff Kagan, an independent telecom analyst in Atlanta. "Alliances, while much better than nothing, can be a very sticky business because they wrestle with too many captains on the bridge and too many competing priorities." ◪

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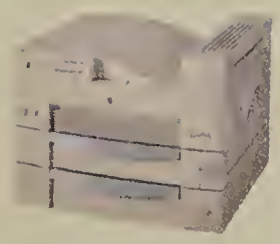

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Briefs

Cabletron has unveiled stackable token-ring switches that let users construct networks of up to 224 LAN segments. The SmartStack Token Ring switches each provide 20 ports for workgroup, desktop or backbone switching. Using a stackable interface option, users have the ability to stack up to eight units. Optional ATM, High-Speed Token Ring and Fast Ethernet uplinks are also available. The switches cost $4,300 to $13,200 and are available now.

Cabletron: (603) 332-9400

FVC.COM has begun shipping a video streaming device for IP networks. Called I-Studio, the product lets users broadcast H.263, MPEG-1 and other video formats from a camera, VCR, Digital Video Disk or CD player, TV satellite or cable feed to their LAN or WAN. I-Studio enables users to record

FVC.COM's I-Studio.

video as it is multicast and then rebroadcast programs for viewers in different time zones or locations. I-Studio costs $21,000 with a 10/100M bit/sec Ethernet interface, or $22,500 with a Gigabit Ethernet or OC-3 ATM interface.

FVC.COM: (408) 567-7200

Mapletree Networks has introduced MPN 2100, a PCI-card that can enable an NT server to support up to 120 voice, fax or ISDN phone calls. MPN 2100 has up to four physical ports for T-1 lines and is based on a motherboard that handles up to 48 calls. Three daughterboards that handle 24 calls apiece can be added. MPN 2100 costs $35 to $60 per port.

Mapletree: (781) 461-4405

Choice expands in the data backup market

Newcomers Ark Research and Network Disk ready wares; veteran Network Appliance dives in, too.

BY DENI CONNOR

The crowded data backup market is gaining new entrants that are focused on making data easier to access even when parts of the network are down.

Start-ups Ark Research and Network Disk, as well as established file server vendor Network Appliance, are readying appliances and software that largely offload from servers the task of writing data to local and remote disks.

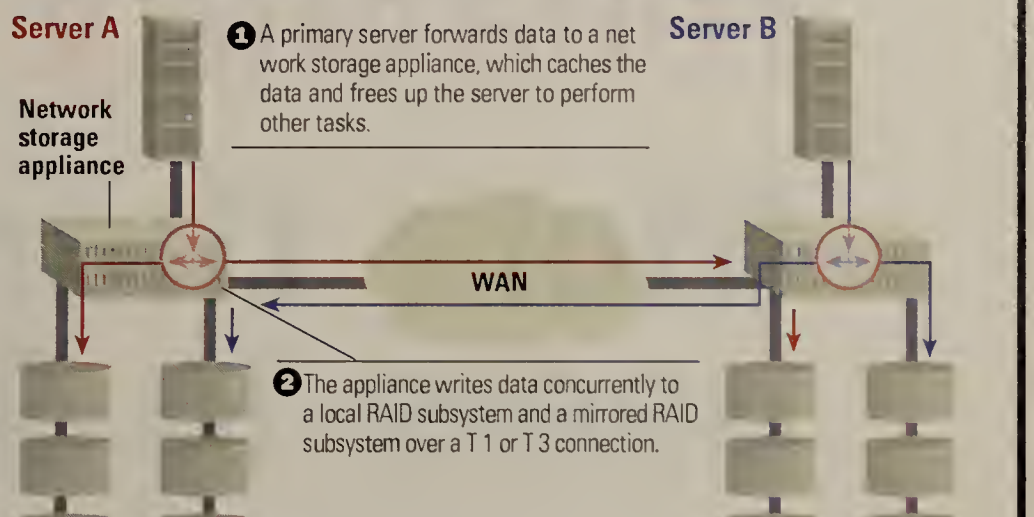
"The data mirroring market represents a $2 billion to $3 billion-per-year business in the mainframe data center," says Michael Peterson, president of Strategic Research in Santa Barbara, Calif. "The parallel is to take this well-established, very successful data center model and move it out to the distributed networks. The market for remote mirroring in 1999 is roughly $4 billion," he says.

Ark, founded by James Bergsten in July 1996, is about to release a data mir-

See **Data backup**, page 24

Mirror, mirror

New products from the likes of Ark Research and Network Disk will enable companies to simultaneously mirror data to local and remote disk arrays.



Larscom reveals new ways to use T-1 lines

New DSU and multiservice access concentrator can help users.

BY TIM GREENE

MILPITAS, CALIF. — Larscom is cranking out more ways for users to buy wide-area bandwidth efficiently when they need more than a T-1 but don't want to pay for a full T-3.

The company last week introduced two products, one for customers who want to use more than one traditional T-1 circuit at a single site, and one for those who want to use multiple ATM T-1 circuits at one location.

WANmaker TerraBoss is a DSU for servicing time-division multiplexed T-1 circuits. TerraBosses can stand alone or be slipped into a chassis called WANmaker with eight others and managed as a single unit. TerraBoss also learns line characteristics and adjusts itself to sync up with whatever gear is at the other end of an active T-1 circuit.

Larscom's TerraBoss is a DSU for multiple T-1s.

TerraBoss is based on Larscom's TerraUno T-1 DSU and incorporates a quick-installation feature called LineLearn, which automatically configures the DSU. The customer plugs in the T-1 line, presses two buttons, and the device learns and matches line characteristics of that particular connection.

TerraBoss can be managed via SNMP through a built-in Web server or via a dial-up Telnet connection.

TerraBoss costs $1,100, and WANmaker costs $1,500.

Inverse-muxed ATM

Larscom also introduced Edge IMA multiservice access concentrators, which take in LAN and voice traffic at a site and send it out as ATM traffic on up to eight T-1 lines.

The multiservice access concentrator uses the inverse multiplexing over ATM (AIM) standard, which splits traffic from a site and distributes it over multiple individual circuits, making them appear to be a single, larger circuit.

The Edge devices come in four- and eight-port models, and can handle data, voice and video traffic. The devices support 10/100 Ethernet, Token Ring, FDDI and ATM networks.

The Edge devices will be available this month and will cost approximately $5,000 for four T-1s or E-1s and $7,000 for eight T-1s or E-1s. An entry-level system with two Ethernets, two 10/100 Ethernets, four T-1 or E-1s, and remote data monitoring is priced at $18,000.

Larscom: (408) 941-4000

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Reliability results vary based on server hardware, server software, performance monitoring and adopting best practices for operations. [3]Electronic Mail and Messaging Systems Newsletter, February 5, 1999 and data from Microsoft

Intel lab not afraid of a few standards scuffles

Intel Architecture Labs spends time pushing standards, mediating between warring camps.

BY SANDRA GITTLEN

HILLSBORO, ORE. — When Tony Salvador needed fresh ideas for Intel Architecture Labs researchers, he went to Alaska to check out the canneries.

Salvador is an ethnographer, someone who studies how people benefit from new technologies. He says the canneries had shied away from technology because of the tough conditions in which they work, namely the wet and fishy docks and boats. But in studying the transactions among the fishermen, tenders (or middlemen) and canneries, Salvado spotted a market for new waterproof wireless tools.

The process of delivering fresh catches to the canneries has three steps. First, fishermen catch the fish and hand them over to tenders who work the docks. The tenders then log the catches, giving the fishermen receipts for the fish. Tenders also send copies of those receipts and related paperwork to the government fishery agencies. Finally, the tenders transfer the fish to the cannery, again logging the transaction with the government.

Salvador told his team at Intel Labs' Jones Farm facility here that waterproof wireless tools would be a big help for the tenders, who often hand fishermen soggy receipts and send the government soiled forms.

With wireless tools, tenders could hop onboard boats, quickly input catches, print out a receipt and, at the same time, e-mail or fax a copy of a preprogrammed form to federal agencies. They could also merge their catch information with that of the canneries. All that information would be stored on a server so that tenders, canneries or even fishermen could access the data later.

Site visits like the one Salvador made to the Alaskan canneries are important for Intel Architecture Labs, one of seven research labs operating under Intel's $70 million research effort. Information gathered by ethnographers is turned over to other company researchers, who decide what ideas have the most merit. The cannery visit not only helped Intel find a new market for wireless tools but also demonstrated the need for wireless standards and technologies.

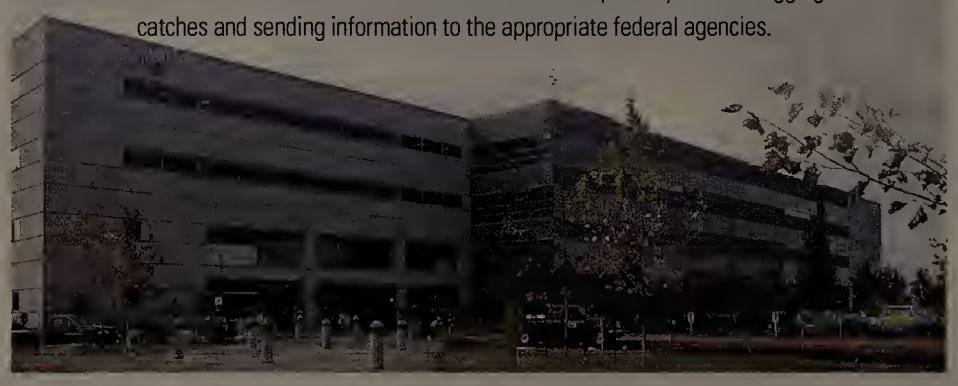
Intel Architecture Labs, established in 1991 and led by Director Craig Kinnie, develops advanced technologies, such as videoconferencing, and creates industry standards upon which others build products. Unlike other corporate research labs, Kinnie says more than 90% of Intel's work ends up in Intel products, as well as the wares of Intel's partners. Most other corporate labs report around 25% of research ending up in products, Kinnie claims.

PROFILE: INTEL ARCHITECTURE LABS

In the Labs

Leadership: Craig Kinnie, director
Located: Hillsboro, Ore.
Founded: 1991
Hot Projects: Policy based management, distributed policy management, videoconferencing over broadband, plug and play DSL, and the DOCSIS cable standard.

Fun fact: Members of the ethnography group, who study user environments, went to Alaska to study the workflow of fishermen sending their catches to canneries. The team was told that what was most needed was a waterproof system for logging their catches and sending information to the appropriate federal agencies.



Cable vs. DSL

Some of the hottest standards work at Intel's labs centers on broadband and IP telephony.

One of the biggest pushes this year from Intel Architecture Labs is for the wide deployment of broadband. Instead of backing cable or digital subscriber line (DSL) technologies, Intel is supporting both efforts. Kinnie says better broadband will lead to a better demonstration of what the Pentium III can do, such as downloading video or showing off 3-D images. This will ultimately help sell chips.

When the company entered the broadband arena last year, DSL and cable were essentially without standards.

Intel researchers worried that a lack of standardization was hurting the broadband industry, and, therefore, would slow the adoption of the Pentium III and future chips.

On one side were DSL vendors that moved at "glacial speeds," says Abel Weinrib, a director at Intel Architecture Labs. On the other side were cable vendors, who were "a bunch of cowboys," says Kevin Kahn, also a labs director.

"We waded in and told [the cable and DSL vendors] that none of us are going to make any money unless we cooperate," Weinrib says.

The goal for the team was to drive through standards for both cable and DSL. That way, standardized modems could be built into computers so DSL and cable installations could become plug and play. Today's DSL installments take more than four hours to complete, which limits customers.

At first, the cable and DSL camps were leery of Intel's involvement because the company didn't have a direct stake in either market. But Intel researchers proved themselves by developing working groups to deal with standards. Researchers now belong to the Universal ADSL Working Group, which proposed a DSL specification that led to the G.Lite standard. The standard is pending final approval in June by the International Telecommunication Union (ITU). The researchers also are part of the cable industry's Data Over Cable System Interface Specification effort to define how cable modems are constructed and will interoperate. In both cases, Intel helped write the standards and create reference designs for the technologies. Intel also developed the Universal Serial Bus technology, which will let users install DSL and cable without using Ethernet network cards.

Voice vs. data vendors

Intel is also playing both sides of the street when it comes to voice and data convergence. Intel is helping voice equipment vendors get data onto their lines and data vendors get voice into their pipes.

"The telephony vendors are under siege, and they have to defend their territory," says Reinier Tuinzing, a director in the Network Communications Group, an Intel product group that works closely with the labs.

Intel Architecture Labs is working with vendors such as Fujitsu, Nokia and Nortel Networks to reduce their 10-year product cycles. Researchers say the best way for these telephony equipment providers to compete is to let go of their proprietary technologies. By using off-the-shelf, standards-based technologies from Intel, Microsoft, Novell and other vendors, telephony equipment companies will be able to cut product cycles dramatically.

Intel is also helping them determine what building blocks they'll need to meld voice and data quickly. The firm already has two building blocks: the Intel VideoPhone and NetMeeting software. These videoconferencing products lay the groundwork for advanced converged communications.

Both products support H.323, the ITU conferencing standard on which many telco equipment providers have already standardized. While efforts are underway in the Internet Engineering Task Force (IETF) to develop a protocol that is geared more toward the Internet, Intel researchers, who co-authored H.323, say H.323 is more mature and just needs to be tweaked for security, billing and more sophisticated addressing.

Meanwhile, Intel says the data vendors have to realize that convergence is more than just throwing voice and data on the same line. There has to be the same level of quality and features that users get with today's voice calls.

To guarantee quality, researchers are hard at work on traffic management. Intel is working with software vendors to develop policy-based management tools. Policies are rules that dictate priority, quality of service and access for network traffic. With protocol drafts in the IETF and Desktop Management Task Force, Intel is chairing both standards efforts.

Intel hopes to license its policy technology to all the big data players, including Cisco and Ascend. Intel Architecture Labs already has worked with Hewlett-Packard to add support for policies in HP OpenView 2.0 and other HP products. ◪

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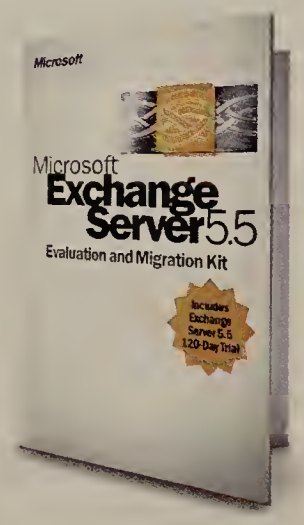

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Data backup,
continued from page 19

roring device based on an off-the-shelf Pentium II machine. Intel or 3Com Fast Ethernet network adapters connect the Ark/2000 appliance to the file server, while a SCSI connector ties the appliance to external disk subsystems. Data is forwarded from the file server to the appliance, where it is cached before being written to local or remote disk subsystems.

Ark/2000s, named for Noah's ark because of the way the animals were boarded two by two, can be paired to support cross-mirroring between servers. They can be linked via a LAN or WAN.

The appliances can link just about any server using any network operating system to any storage device. For instance, via the firm's rudimentary embedded file system, Sun servers can attach to Windows NT RAID arrays, and HP-UX servers can attach to Compaq StorageWorks RAID arrays. Also, multiple servers running different operating systems can be connected to a single Ark/2000 to allow local or remote disk sharing.

"Ark is packaging a plug-and-play solution that works with legacy products," Strategic Research's Peterson says: "You don't have to do a forklift upgrade to install it."

The product initially will work with only SCSI devices but will support Fibre Channel arbitrated loop devices in June. The offering will be available this month through resellers and distributors for $30,000 per two-node system, including the network appliance, network adapters and software.

Windows NT focus

Network Disk, a self-funded start-up in Framingham, Mass., takes a similar approach to local and remote data mirroring with its self-named product but focuses only on Windows NT networks and storage systems.

Network Disk sells software that runs on an off-the-shelf Intel processor-based PC and sits between the server and external storage. The box running Network Disk's software can then mirror data from a server to local or remote disk arrays.

In addition, Network Disk adds "snapshot" copy capability, in which an image of the disk is taken at many points in time and copied to a local or remote disk. Network Disk will support Fibre Channel arbitrated loop and switched networks by year-end.

Ilya Gertner, Network Disk's founder, is on the prowl for beta customers. Pricing for the Network Disk software starts at less than $4,000 per machine.

Network Appliance dives in

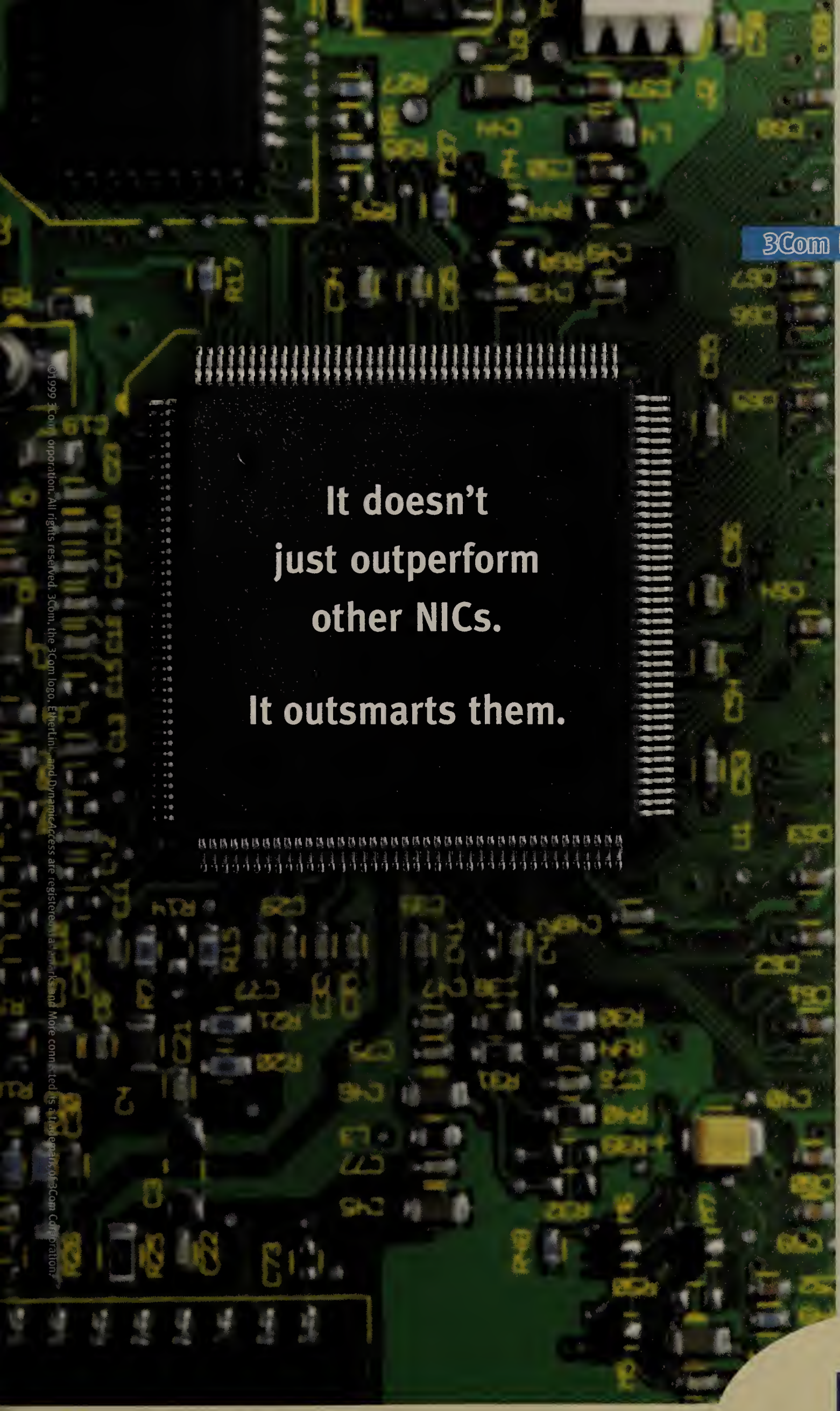
Separately, Network Appliance last week announced enhancements to its NetApps file server operating system to provide mirroring and improved snapshot backup capabilities.

The SnapRestore feature lets a company undo any changes made by Network Appliance's snapshot technology and revert to any previous image. This technology is useful for recovering from database corruption. System administrators can roll back the database to a previous image and play change logs forward until database integrity is restored.

Network Appliance's new SnapMirror technology also allows replication of one or more volumes of data between servers for backup purposes.

SnapRestore costs $2,000 to $9,000, while SnapMirror costs $10,000 to $50,000 per server.

Ark: (408) 260-5900; Network Disk: (508) 872-4586; Network Appliance: (408) 367-3000



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Internetworking Monitor . Kevin Tolly

SWITCH METRIC — WATCH THIS SPACE

The SmartBits test tools are taking a well-deserved break, the circuit breakers have stopped tripping and The Tolly Group's engineers are crunching the numbers. Next week, in *Network World* and on The Tolly Group's Web site, we'll unveil the first set of results for the 1999 Tolly Group/*Network World* Switch Metric (see feature in May 10 issue).

The response from the vendor community has been enormously positive. When *Network World* Editor in Chief John Gallant and I introduced this initiative just before January's ComNet 99 trade show, we heard responses of "count us in" almost instantaneously. In fact, the only major player that has not yet endorsed the project is Cisco.

While the Switch Metric benchmarking process will be ongoing — switches will be tested continually throughout the year — it was quite clear that a number of vendors wanted to be represented when the first sets of results were unveiled. In the end, we had test gear piled sky-high, power cords running every which way and multiple vendors testing in the lab at the same time.There were some vendors that we simply could not accommodate before the deadline — but results of ongoing tests will be posted as they become available.

In the first round, you'll see 15 switches from nine vendors — 3Com, Allied-Telesyn, Cabletron, Foundry Networks, Hewlett-Packard, IBM, Lucent, Olicom and VIPSwitch. Vendors were free to choose topology, number of ports and layers tested. Several vendors tested products in different configurations, so you'll see more than 15 sets of results.

The most complex tests conducted on the largest scale centered around pure Gigabit Ethernet configurations. Vendors presented seven products and not only chose the largest port configurations, but more complex logical configurations as well. Chassis with 12 to 64 ports of Gigabit Ethernet were represented. In addition to Layer 2 switching throughput, we conducted Layer 3 IP tests and Layer 3 IPX throughput tests, as well.

The performance of these Gigabit Ethernet products shows that this technology is clearly ready to take on a major role at the center of large, multiprotocol networks. Better yet, from a performance point of view, the "average" throughput was wire-speed for all tests. Very impressive.

Six Fast Ethernet switch tests were completed in time to make the cutoff. Interestingly, all of the Fast Ethernet testing was confined to Layer 2 — at the vendors' request. Clearly, the vendors see these products fitting nicely into the flat, departmental arena. Again, wire-speed was the rule.

In keeping with market tendencies, there was much less token-ring presence than Ethernet. In fact, only one vendor, Olicom, brought in token-ring gear for this round. IBM clearly was interested in establishing its Ethernet products. Olicom, following IBM's lead into Ethernet, is also slated to deliver Ethernet gear to be benchmarked in the very near future.

Stay tuned for the results.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300, ktolly@tolly.com or www.tolly.com.

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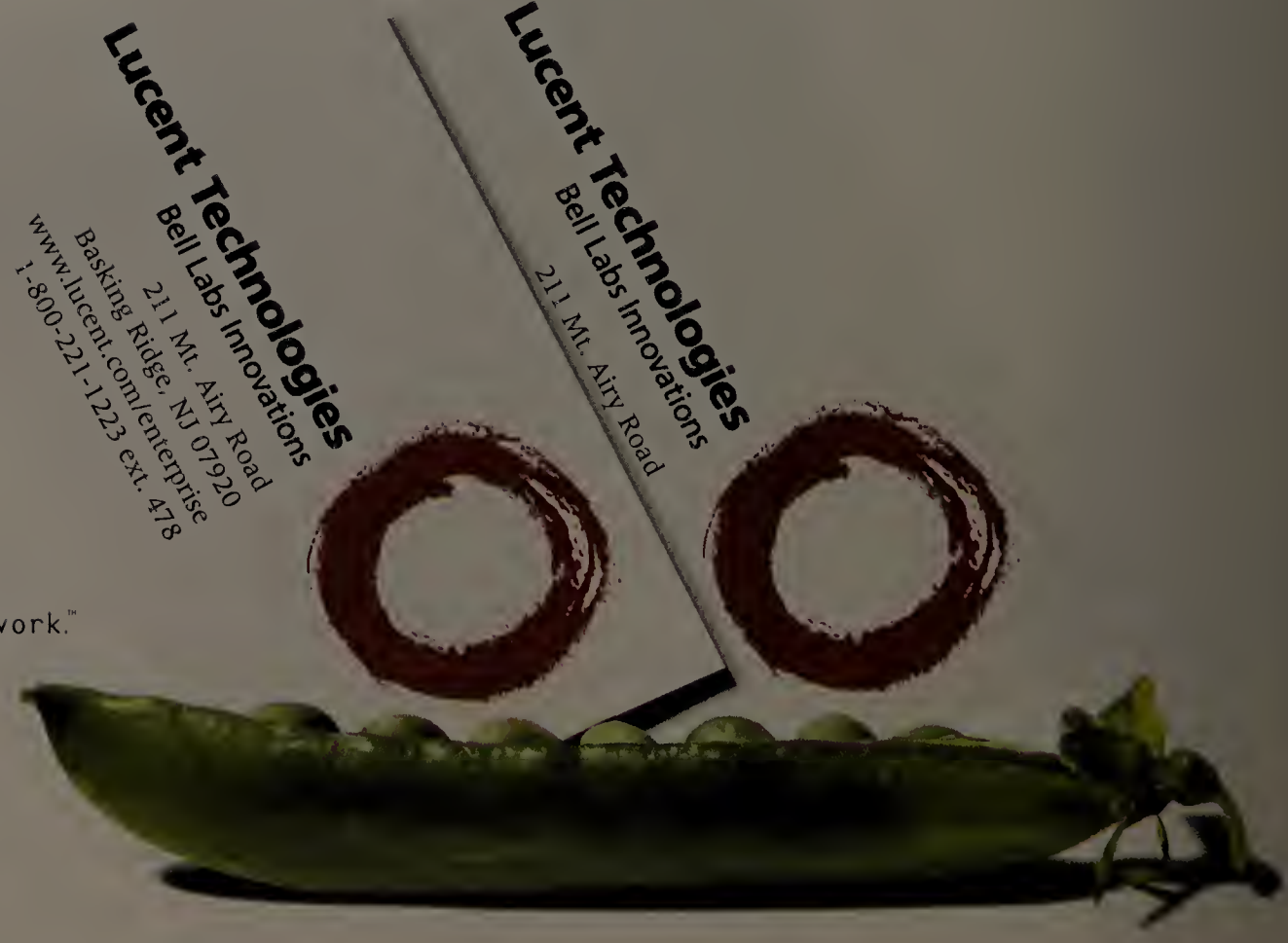

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Briefs

Customers looking for digital subscriber line (DSL) services have a new company to check out: **Intermedia Communications.**

The company plans to sell high-speed DSL access links in San Francisco, Chicago and Boston within 90 days. More cities will be announced later this year. Service speeds range from 100K bit/sec to 1M bit/sec, and prices range from $120 to $250 per month.

Intermedia will use DSL carriers NorthPoint Communications and Rhythms NetConnections to set up the DSL links, which convert regular phone lines into high-bandwidth dedicated connections to the Internet or corporate networks.

Intermedia: (800) 940-0011

Competitive local exchange carrier **E.spire Communications** is selling 15,000 of its customer lines to Florida-based Access One Communications.

The company had been reselling the lines, which belonged to BellSouth. The move is part of E.spire's plan, announced late last year, to get out of local resale because the profit margins were too low.

Verio is making it easier for business users to support e-commerce outside the U.S. with its new CyberSource service. CyberSource, coupled with Verio's Web hosting service, will let customers use 29 international currencies on their e-commerce Web sites. CyberSource uses settlement services from IBM Global Merchant and National Westminster Bank.

Verio customers can add international currency settlement services to their Web sites for an additional $50 per month.

Verio: (303) 645-1900

New tools monitor ISP net performance

Software from Inverse and Netcom lets users track transfer rates and packet loss.

BY DENISE PAPPALARDO

New software monitoring tools that will let business users keep a close eye on their dedicated Internet access links are coming soon to an ISP near you . . . or are they?

Inverse Network Technologies and Netcom Systems are rolling out monitoring products that will let business users track usage, packet loss and latency over their dedicated Internet access links.

Users want to make educated decisions when it comes to rolling out new applications over the Internet and checking up on their service level guarantees (*NW*, April 19, page 10). Without tools that provide statistics, such as bandwidth utilization or throughput, users can't fully trust their Internet links.

But if ISPs start rolling out monitoring tools from companies such as Inverse and Netcom, that all may change.

Inverse's latest

Inverse has been providing ISPs with dial-up Internet access performance statistics for nearly two years. Inverse's latest product, IP insight Dedicated Operations, is the company's first offering for dedicated Internet access performance monitoring and is expected to be released by the end of the month.

NETWORLD+INTEROP 99

Inverse's software is being tested by a handful of ISPs, says Chris Roeckl, marketing director at Inverse in Sunnyvale, Calif. IP insight includes software agents that run on Windows NT servers and monitor an ISP backbone, as well as specific customer links for packet delivery and port utilization.

Monitoring the situation

These are the very tools that users such as Terry Dymek, director of infrastructure at John Hancock, are looking for.

"I want a Web-based tool that shows utilization, dropped packets and any type of physical line restraints," Dymek says. "We have that today with our frame relay network, and I want it for our six dedicated Internet access lines."

But Dymek, like most business users today, is waiting while his ISP tests new products or develops tools in-house.

Netcom also recently rolled out monitoring software and hardware products, called SmartISP. Netcom plans to introduce enhancements to this product at NetWorld+Interop 99.

At the show, the company will introduce the next version of the software, which will include monitoring for classes of service.

Netcom's new software

The new release will be based on the Internet Engineering Task Force's Differentiated Services specification, which outlines how vendors and ISPs can set up standards-based classes of services over the Internet. SmartISP supports the IETF's guidelines to ensure that ISPs are living up to service level guarantees for each service class.

SmartISP includes a Visual Basic Analyzer, Netcom's SmartBits chassis and SmartMetrics cards.

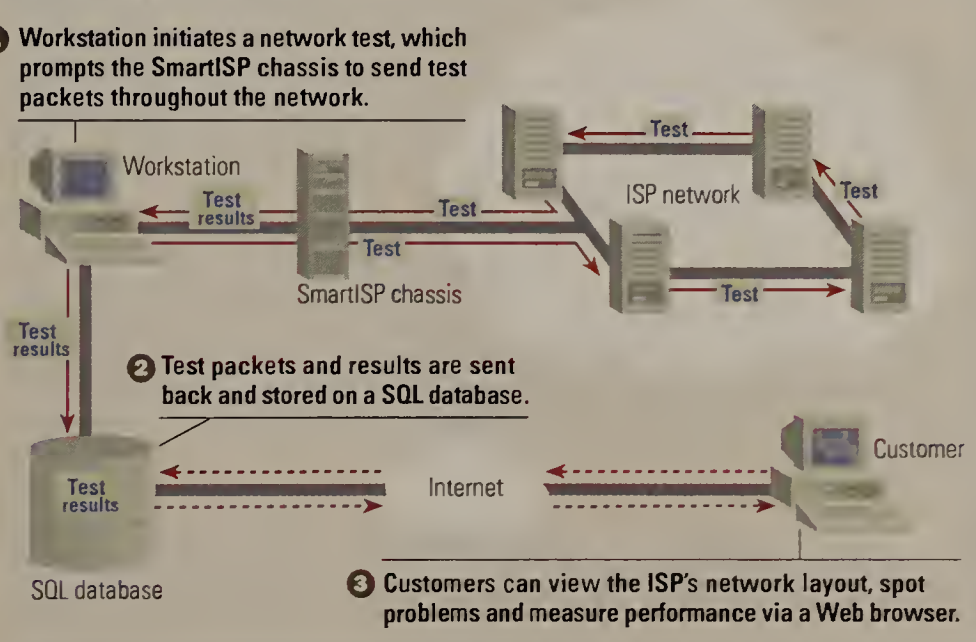
Netcom's SmartISP works by sending small amounts of test traffic onto an ISP's network. SmartISP then records key measurements, such as TCP transfer rates, packet loss and timeouts, as well as latency variation, such as jitter. This information is gathered and stored on a SQL-compliant database. ISPs can then set up a Web site that taps into the SQL database to present each customer with the statistics on their particular connections.

Netcom's approach differs from Inverse's primarily in that while Netcom's equipment sends test traffic over an ISP's network, Inverse's products test performance on an ISP's network based on commercial traffic.

Netcom's product has been shipping for two weeks, but Netcom says the ISPs that are testing the product don't want to talk about it publicly yet.

Putting ISPs to the test

Netcom's SmartISP software lets ISPs test their networks and then present a model of the network to customers.



Eye on the carriers . David Rohde

THE BIG WIRELESS HYPOCRISY

Recently, we ran a few stories exposing the reason why area codes keep multiplying across the country. It's not that people keep ordering more wireless services or fax and computer phone lines, as the telcos say. It's that every carrier entering the market must order phone numbers in batches of 10,000 in every local calling area because of an outdated method of handing off calls. That's leading to massive phone-number waste and a possible exhaust of all numbers nationally by 2007.

One reader wrote me with a potential solution: Give the wireless carriers their own area codes and make them use them up before they get any more. Fine idea, I wrote back, except the Federal Communications Commission banned that practice several years ago.

Seems the lobbyists for the wireless industry ran to the FCC and said it was unfair to assign wireless carriers numbers in unfamiliar area codes. The FCC should have the same rules for all communications technologies so as not to favor one over the other, they said.

That was understandable. This was back in the days when an episode of *Seinfeld* featured the Elaine character waiting for an old woman in her Manhattan building to die so she could steal the woman's prized 212 area-code number.

But things have changed since then. Under a new FCC rule, telephone numbers are now supposed to be portable among carriers. That means even if you change from one carrier to another in the same metropolitan area, you can keep your old phone number.

Faced with complying with this regulation, the wireless lobbyists recently ran again to the FCC and made *precisely the opposite argument* they had made before. Wireless carriers are *totally different* than wireline carriers, they said. People only want to keep their wireline telephone numbers when they switch but don't feel so strongly about their wireless numbers. Amazingly, the FCC bought the lobbyists' about-face and granted a delay in wireless number portability until November 2002.

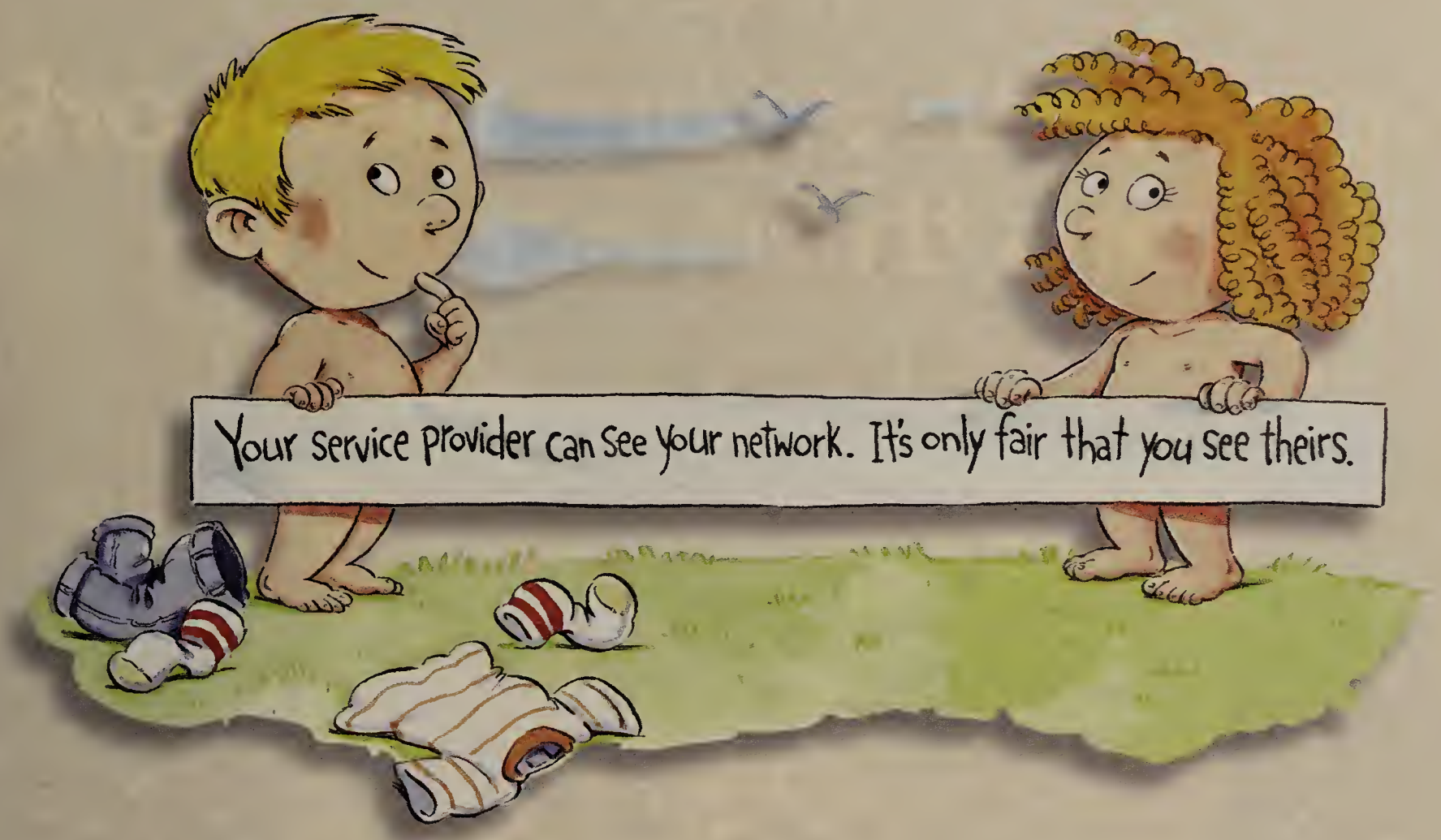
Something else has changed, as well. Some people have had to change their area codes twice. In many cities everyone now has to dial 10 digits even for local calls, and experts agree the day is coming when your neighbor will have a different area code than yours.

So the idea of area-code-as-status-symbol is losing ground. I mean, I carry my wife's cell phone number in my wallet, but if you pinned me against the wall I couldn't tell you what it is. What difference does the area code make?

One wireless lobbyist told me one big goal is "substitutability" — the desire to use your wireless phone as your principal phone. OK, but they can't have it both ways. Either wireless phones are critical, in which case they shouldn't be stuck in area-code ghettos but the numbers should be portable, or they're supplementary. In which case the numbers don't need to be portable, but carriers should live with funky area codes.

The FCC is about to issue more rules to clean up the mess. If it wants the rules to work, the FCC should quit caving in to two-faced arguments from the carriers who have to fix the problem.

Rohde is a senior editor with Network World. *He can be reached at drohde@nww.com.*



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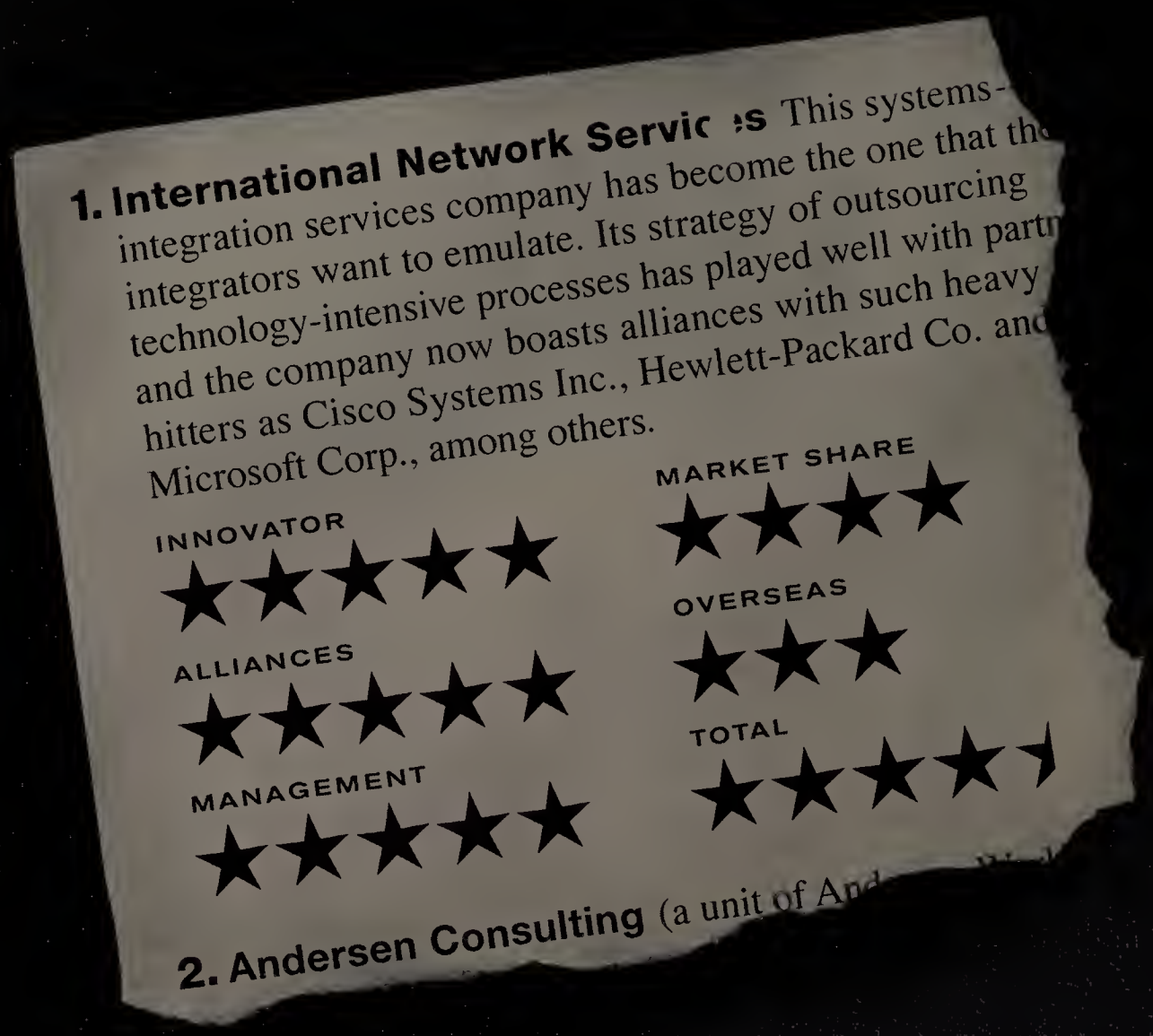

–Yankee Group/Upside Magazine, FEBRUARY 1999

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Briefs

Percussion, of Stoneham, Mass., claims Lotus Domino administrators can cut the time they spend on routine management tasks in half with the latest release of the company's product, ServerAdmin Plus. New features in ServerAdmin Plus 3.1 include the ability to delegate specific servers and tasks to individual administrators, easily recertify expired user IDs, and move complete mail files from one server to another. Available immediately, ServerAdmin Plus costs $1,000 per server.

Percussion: (800) 283-0800

There's a new buzzword attempting to make its way onto the tongues of computer users: context management. **Verano** has coined the phrase to describe Iluminar 2.0, a new tool for organizing, managing and finding disparate corporate data. Iluminar wraps data files with metadata containing information such as location and author.

Users need only a browser and the Iluminar server address to search for information anywhere in a corporate network. Administrators can implement security policies to limit access to certain files. They can also track how often and by whom a particular piece of data has been accessed and used. Iluminar is priced at $25,000 and is available for Windows 95, 98 and NT, and Sun Solaris.

Verano: (650) 237-0200

Heroix has released software to repair unresponsive Windows NT servers without rebooting. When a server fails, RoboMon Emergency Repair lets network managers bypass the Windows NT graphical user interface and take control of the server through MS-DOS. Heroix in Newton, Mass., is shipping this add-on to its RoboMon systems.

Radnet recast as a portal player

BY JASON MESERVE

WAKEFIELD, MASS. — After losing its David-vs.-Goliath bid against Lotus/IBM in the groupware collaboration market, Radnet is making a comeback with a new business-to-business portal offering.

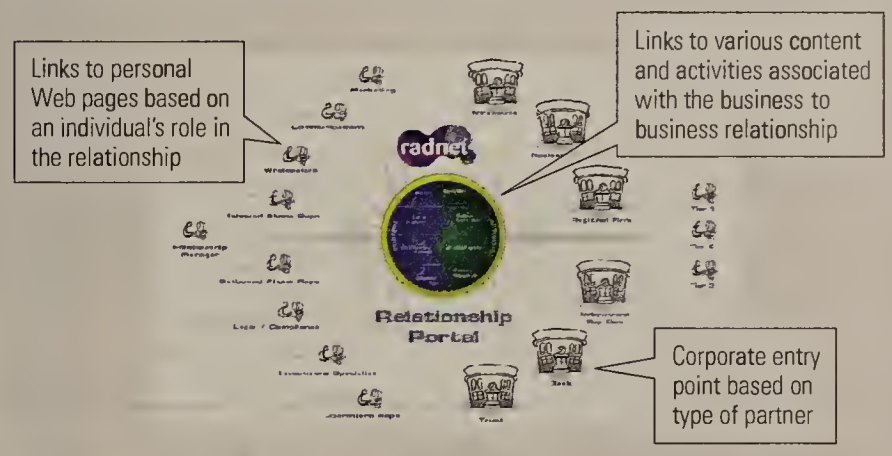
Scheduled for launch later this month, Radnet's PortalWorkX is targeting the sales channel market rather than the intranet space, which is being flooded with portal products. Radnet is focusing its strategy around the relationship between companies, not necessarily the transactions that occur between them. (See "E-commerce portals open for business (to business)," page 40.)

"We're trying to capture the essence of the selling/partner relationship," says Radnet President and CEO David Scult. "We are putting the person to person back in business to business."

Using the PortalWorkX component framework, vendors can integrate and share information with their sales partners using a browser. Partners can tailor the information flow to include only the data that is most important to them, Scult says. In turn, partners can create a subportal for sharing information with their customers.

Helping your partners

Where most portals focus on the intranet and internal collaboration, Radnet's new PortalWorkX product is targeted at improving a company's business-to-business relationship with its partners and customers.



Unlike Radnet's original product, WebShare, PortalWorkX is not a combination server and development tool. Instead, the company has built a series of Microsoft Common Object Model objects and modules that use Java to access and integrate information.

The initial framework supports Microsoft Transaction Server and Active Server Pages. Future releases of the product will feature support for Enterprise JavaBeans as well.

Data can be culled from databases, flat files, directories and third-party applications, Scult says. End users require no special plug-ins, just a standard Web browser.

Scult stresses that Radnet provides only the framework, and that companies must add their own business logic and system integration efforts. "It is around $500,000 to $1 million to implement such a strategic system," Scult says.

The release of PortalWorkX marks a new strategy at Radnet. The company, started by a group of ex-Lotus employees, originally looked to bring the benefits of Notes collaboration to the Web. Then IBM bought Lotus, giving Notes developers a new vigor toward the Internet.

"It's not a long-term business plan if we're just trying to be a better Domino," says Scult, who came on board 18 months ago to help right a listing ship. Although Radnet experienced a quiet period, it has now discovered the business-to-business portal niche, an area it believes is underserved by big vendors such as Microsoft, Netscape and IBM. The company is growing again, with nearly 100 employees, up from a low of 50 near the end of 1997.

"They certainly have a more focused strategy, and their repositioning is good," says Charles Smulder, senior industry analyst at Gartner Group's DataQuest division in San Jose. Smulder would like to see Radnet develop more partnerships to help give more weight to its message.

PortalWorkX will ship with a starting price of $100,000. Scult predicts system integration expenses will be between two and four times the product cost.

Web server tool catches sales order errors

BY ELLEN MESSMER

CARY, N.C. — Filling out a sales order on the Web for complicated goods, such as network equipment, is fraught with peril because users can easily botch part numbers or make configuration mistakes.

But a new Web server tool called eMechanix from Newtonian Software promises to prevent those types of problems. The eMechanix software monitors the sales-order process and automatically checks entries against back-end databases or enterprise resource management systems. The software, typically known as a "configurator," can tell if a product is in stock or if the user has incorrectly entered a product number, configuration or price.

According to Newtonian Software CEO Chaz Henry, eMechanix works by letting users state the purchases they want to make and then guiding them toward those types of items.

Newtonian expects to have the Web configurator out this month, priced at about $50,000.

Newtonian Software: (919) 790-8894

PROFILE: NEWTONIAN SOFTWARE, INC.

Headquarters:	Cary, N.C.
Founded:	1989
CEO:	Chaz Henry
Primary product:	Sales Mechanix enterprise sales system
Employees:	32
Web address:	www.newtonian.com

Keyfile gets into electronic commerce game

Workflow software vendor delivers suite for NT users that helps automate the procurement process.

BY ELLEN MESSMER

NASHUA, N.H. — Keyfile, a decade-old firm that provides workflow-based imaging systems, is turning its attention to electronic commerce with a suite of software modules that automate the procurement process.

Called Keyflow Commerce, the software suite combines Web forms, document management and workflow features. The suite enables a buyer to fill out a purchase request at the desktop and have that requisition routed to the procurement manager for approval.

Keyflow Commerce, which works on top of Microsoft Exchange, lets the buyer enter the approved order into a corporate database or enterprise resource planning system after sending it to the supplier by e-mail, fax or other means.

Keyflow Commerce comes with NT-based server software called the Active Document Workspace. This component holds the document repository, which is accessible through a Web browser. The documents are made part of a structured workflow, which can be organized using a tool called the Keyflow Designer.

Another Keyflow Commerce software module is an XML Engine for serving up forms in Extensible Markup Language. If a user demands high availability of the document repository, there's a component called the Enterprise Server, which provides cluster and fail-over support.

In all, there are eight software modules in the package. The core components are available now, with a few, such as the XML Engine, slated for fall shipment. The average customer configuration would cost $50,000, according to Keyfile.

The state of Illinois university system plans to install the Web-based Keyflow Commerce this summer.

"The state legislature now requires us to put contracts out to bid in electronic format," says Gloria Keeley, director of systems and business development in the state of Illinois office of business affairs.

"We decided the Web was the only possible mechanism we could [use] to do this," Keeley says.

The state of Illinois university campuses have already started using custom-designed electronic forms to post contract information. But using Keyflow Commerce will eliminate the universities' need to develop the Web forms on their own.

"And once we have bidders registered, we'll be able to take the bids they've submitted and respond to them through our own workflow process," Keeley says.

Keyfile: (603) 883-3800

New middleware brings PCs and host databases together

StarQuest's StarSQL 3.0 is aimed at bridging the gap between Web clients and back-end transaction systems.

BY JOHN COX

BERKELEY, CALIF. — StarQuest next month will ship a new version of its connectivity software that marries Windows PC applications to IBM DB2 databases and mainframe transactions systems.

The goal of StarSQL 3.0 is to bridge the gap between PC and Web-based clients and the back-end transactions that are vital to electronic commerce.

StarSQL 3.0 includes the following new features:

- A two-phase commit protocol, for transactions on several databases.
- Open Database Connectivity (ODBC) 3.0, to let the newest Windows applications link to DB2.
- Unix support, so applications on Solaris servers can access DB2.

With the two-phase commit protocol, Windows NT applications can update an array of databases and enter transactions based on message queuing middleware, according to StarQuest President Paul Rampel.

"With Microsoft Transaction Server now bundled in NT, the infrastructure is in place to support two-phase commit functions from Windows applications to IBM hosts," he says.

Also new in Version 3.0 will be changes to StarSQL's static SQL, which boosts performance for some applications. In the new version, packaged software, such as Microsoft Access or Crystal Reports, will be able to exploit pre-written SQL queries, called static SQL, for the first time.

Also new is the Database Connection Wizard, which automatically reads the needed DB2 configuration parameters so users don't have to enter this data.

Version 3.0 will support Java applications by using Sun's ODBC-to-Java Open Database Connectivity bridge. StarSQL has been widely — but invisibly — deployed as the DB2 access component in Microsoft's SNA Server. This will be discontinued, and StarQuest will offer StarSQL as a separate product on NT and Unix computers.

Recently, router vendor Cisco licensed StarSQL, and made it part of the Cisco Transaction Connection router software. As a result, this DB2 connectivity software will become a network service for Cisco customers.

StarSQL 3.0 will ship this month. Pricing for the Pro Server edition starts at $3,995.

The Enterprise Edition is free to users of Cisco Transaction Connection.

StarQuest: (800) 763-0050

QUICKTAKE

Sterling Commerce's Webforms 3.0

Sterling Commerce last week introduced a redesigned version of its software-based service for receiving purchase orders in HTML format and converting them into electronic data interchange (EDI) documents. The company has revised its Webforms offering to better serve small companies unfamiliar with EDI. Version 3.0 features a new graphical user interface that lets users convert a purchase order into an invoice with one mouse click. The service now allows users to create and store document drafts as well as keep a document history.

Sterling collects fees from both a larger, sponsoring EDI user, such as a company like General Motors, and also from the user's trading partners that use the Webforms service, such as GM suppliers. Sterling charges the larger user $15,000 to make a single EDI business document available through Webforms and $5,000 for each additional document. For the trading partner, it costs $25 to register to become part of the Webforms user community and about $40 per month for up to 40 business-document conversions.

Sterling: (800) 299-4031

HEWLETT PACKARD

If your IT Management solution fails, which thank-you gift will the boss be sending you?

The word is out. Far too many enterprise management projects don't deliver. So, what's the hang up? Recent industry analyst studies reveal that most major framework implementations take too much time and don't deliver ROI. After years of work, only a small portion of purchased functionality is actually implemented. There is a better way.

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*Source: Network Computing, Syracuse University Real-World [illegible]

Start-up offering e-mail security for Exchange networks

BY PAUL MCNAMARA

HAIFA, ISRAEL — Vanguard Security Technologies, an Israeli start-up, will unveil its e-mail security and policy enforcement software for Microsoft Exchange at next week's NetWorld+ Interop 99 trade show in Las Vegas.

The company last week began shipping a separate version of MAILguardian Enterprise (MGE) for Simple Mail Transfer Protocol-based clients, such as Microsoft Outlook, Outlook Express, Netscape Mail and Eudora Pro.

The version that covers Exchange Server is in beta and is expected to be delivered next quarter. Support for Lotus Notes/Domino and Novell GroupWise will follow, according to Hanan Friedman, president and CEO of the company.

NETWORLD+INTEROP 99

One industry expert believes that MGE, while an unproven commodity, holds significant potential for organizations looking to tighten up their e-mail security and usage policies.

"I think they're on to some very interesting features and solutions that I don't see available from other suppliers," says Jim Hurley, an analyst with Aberdeen Group in Boston.

MGE consists of three components:

- MAILguardian Manager is a Windows NT-based central management component that administrators use to define and enforce e-mail security policies for workgroups or individuals. The software also handles key management and message delivery guarantees.
- MAILguardian Agent is a desktop component that enforces a company's e-mail security policies on an end user's PC without any action required by the end user. The agent applies customizable content-filtering rules that a customer establishes through MAILguardian Manager on both incoming and outgoing messages. The desktop agent is distributed by MAILguardian Manager and is automatically installed when end users click on an e-mail attachment.
- MAILguardian Partner is a free component that customers may distribute to their business partners to establish encrypted e-mail communications. MAILguardian Partner does not include the policy-based features of the other two pieces.

Exchange customers will be particularly interested in MGE, Friedman says, because it allows a message to remain encrypted on the server while an authorized recipient decrypts and views the text on his desktop.

With Exchange alone, a message that is decrypted on the desktop is also decrypted and visible to unauthorized eyes on the server, he says.

MAILguardian Enterprise costs $2,495 for 25 users and $25,995 for 1,000 users.

Friedman says Vanguard Technologies intends to open a subsidiary office in the Boston area within a few months.

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'Net Insider . Scott Bradner

AMERICANS AS SECOND-CLASS CITIZENS

If the press reports are to be believed, and they are all too believable, the Clinton administration is about to codify its opinion that U.S. citizens are second class when it comes to the Internet. The administration is about to agree with European officials that a European's privacy is more important and deserves better protection than does an American's.

The European Union last year passed laws to protect the privacy of individuals. Basically, the laws require companies that collect information about you to tell you that they are doing so and why, and to give you a chance to opt out. For more sensitive data, the individual has to grant specific permission before that data can be shared.

The Europeans threatened to ban U.S. companies from doing business in Europe, including over the Internet, unless they agreed to the rules. The Clinton administration first tried to get the Europeans to back down, but they would not. Then the administration proposed a plan by which U.S. businesses could claim that they would meet the rules and be allowed to do business. Part of the administration's plan is that adherence to the European rules would be required only when firms were doing business with European citizens, and not be mandatory when the same companies dealt with U.S. citizens.

This is not the first time this administration has come down on the side of the privacy abusers. To this administration, details of one's personal life — including religious or political views, sexual practices and maybe even medical history — are fair game for exploitation by anyone with the money.

The administration claims that voluntary programs will protect us from the abuses of the database industry. But these officials must be on another planet, if not in another universe.

The administration argues against legal penalties. There are no risks to the data abusers other than the remote possibility that some abused individual will have the gumption to sue for the few dollars that the courts might award for "actual damages." The Clinton administration pretends to think that the billion-dollar business of knowing you better than you know yourself will protect your rights. I'd say what I really think about this, but my editor would undoubtedly cut the adjectives.

It's a mixed blessing that Congress is reviewing more than 50 bills written to protect the privacy of Internet users. Although it is good to see that someone in Washington understands the unreality behind the grave concern for individual rights that big business repeatedly claims, most of Congress lives in a clue-free zone when it comes to technical realities. (For example, I fully expect some Congressional critter to introduce legislation to postpone the Year 2000 deadline.) But I do hope that something will come out of Congress that works better than the administration's plan to pray to the tooth fairy.

Disclaimer: Some people say that Harvard has too many clues for the good of others, but this rant is my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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E-commerce portals open for business (to business)

BY ELLEN MESSMER

Web-based portals built for business-to-business electronic commerce are starting to dot the Internet landscape, which until now has taken portal to mean a content-rich search engine, such as Yahoo or Lycos.

These business-to-business e-commerce portals let trading partners swap purchase orders and other critical documents over the Internet. Once the document is deposited at the portal, the portal either stores it for retrieval or forwards it immediately to the intended recipient's server.

These e-commerce portals typically log all this vital activity and handle document conversion, too, translating HTML or other formats into fax or electronic data interchange. In this regard, they evoke the spirit of electronic data interchange value-added networks (VAN), which continue to process huge volumes of business data, mostly for larger corporations.

But old-style EDI VANs are based on proprietary protocols and technologies for store-and-forward mailboxing. In contrast, e-commerce portals are built on IP protocols so they can push documents along quickly using the Web's HTTP or File Transfer Protocol.

Proponents of portals think it's going to be much easier, and less expensive, for smaller firms to do electronic trading over the Internet than traditional EDI.

Not surprisingly, a number of traditional VANs are jumping on the e-commerce portal bandwagon, hoping to pick up new business or offer a migration path. Harbinger Corp. says it intends to migrate 6,000 corporate customers this year from its traditional EDI VAN to the new e-commerce portal it opened this month, called Harbinger.net.

While there's no sign of a stampede yet among Harbinger's EDI customers toward this e-commerce portal, at least two companies, Armstrong Air Conditioning and Honeywell, have started to do business with hundreds of their smaller suppliers via Harbinger.net.

NEW E-COMMERCE SITES

Companies old and new are tooling up to tie businesses, and their many partners, together.

E-commerce portal speeds business process

DaimlerChrysler's trading partners worldwide make use of the GE TradeWeb e-commerce portal to send documents to the auto giant.

Users authenicate their identity here to gain access to Web services for sending HTML based purchase orders that can be converted into EDI.

Users find out which other trading partners can receive purchase orders and other documents through the GE TradeWeb.

GE Information Services, one of the biggest EDI service providers, two years ago launched GETradeWeb.com as a Web front end to its VAN — long before it was cool to call this a portal.

"DaimlerChrysler is using this to exchange 18 different types of documents with their suppliers around the world," says Jeff Anderson, global product manager for GE Trade Web, which is estimated to have a total of 3,500 trading partner subscribers.

Hey, we're portals, too

No single group has latched harder onto the e-commerce portal buzzword than software upstarts such as Intelisys Electronic Commerce, Ariba Technologies and Commerce One.

Their bread-and-butter has been making and selling high-end procurement software. But now each of these start-ups is angling to provide transaction-based services, too. In portals they either operate alone or in partnership with a high-tech provider. Commerce One announced ambitious plans for this year to construct three global e-commerce portals based on its software, with help from British Telecommunications, MCI WorldCom and NTT. These three telecom giants will each host the service and share a percentage of the transaction fee with Commerce One.

And then take feisty e-commerce vendor Ariba. It sells an intranet product called Operating Resource Management System (ORMS) for managing desk-top-based purchasing from electronic catalogs. Ariba is now partnering with Hewlett-Packard to build the Ariba.com Network. This Internet-based transaction-processing service is slated to debut in June.

Cisco is beta-testing the Ariba portal, which uses ORMS internally to automate the procurement of office supplies. Until recently, Cisco had been sending out ORMS-generated orders to its suppliers by e-mail. "But with the high volume, this e-mail doesn't integrate very eloquently with our suppliers' systems," says Cisco's business process design manager, Carolyn DePalmo. "It causes them to re-key the data."

Instead, Cisco will send these purchase orders directly to the Ariba.com Network, where they could be converted into a variety of data formats favored by each supplier, or put into an EDI VAN.

In a similar manner, Ariba competitor Intelisys is opening its own business-to-business on-ramp named Intelisys.com, with Houston manufacturer Hose and Fittings as an anchor tenant.

Cisco is beta-testing the Ariba electronic commerce portal to send purchase orders to suppliers.

Health-conscious portals

There are also portal initiatives taking shape to serve specific vertical industries. ChannelPoint, Inc., for example, is constructing a portal called ChannelPoint Commerce for the health insurance industry.

"It's a $700 billion market dominated by independent brokers," says Lyle Ekdahl, ChannelPoint's vice president of product marketing. "This will be the first Internet exchange for insurance." ChannelPoint, set to open in June, has about a half-dozen insurance carriers, including United HeathCare and a few of the regional BlueCross/BlueShield companies, set to use the portal.

These insurance companies will use ChannelPoint to post insurance quotes for the brokers and process orders sent from them. "We get paid when we deliver business to the carrier," Ekdahl says. "They pay us a percentage of the business." It will be free for brokers, though. ◪

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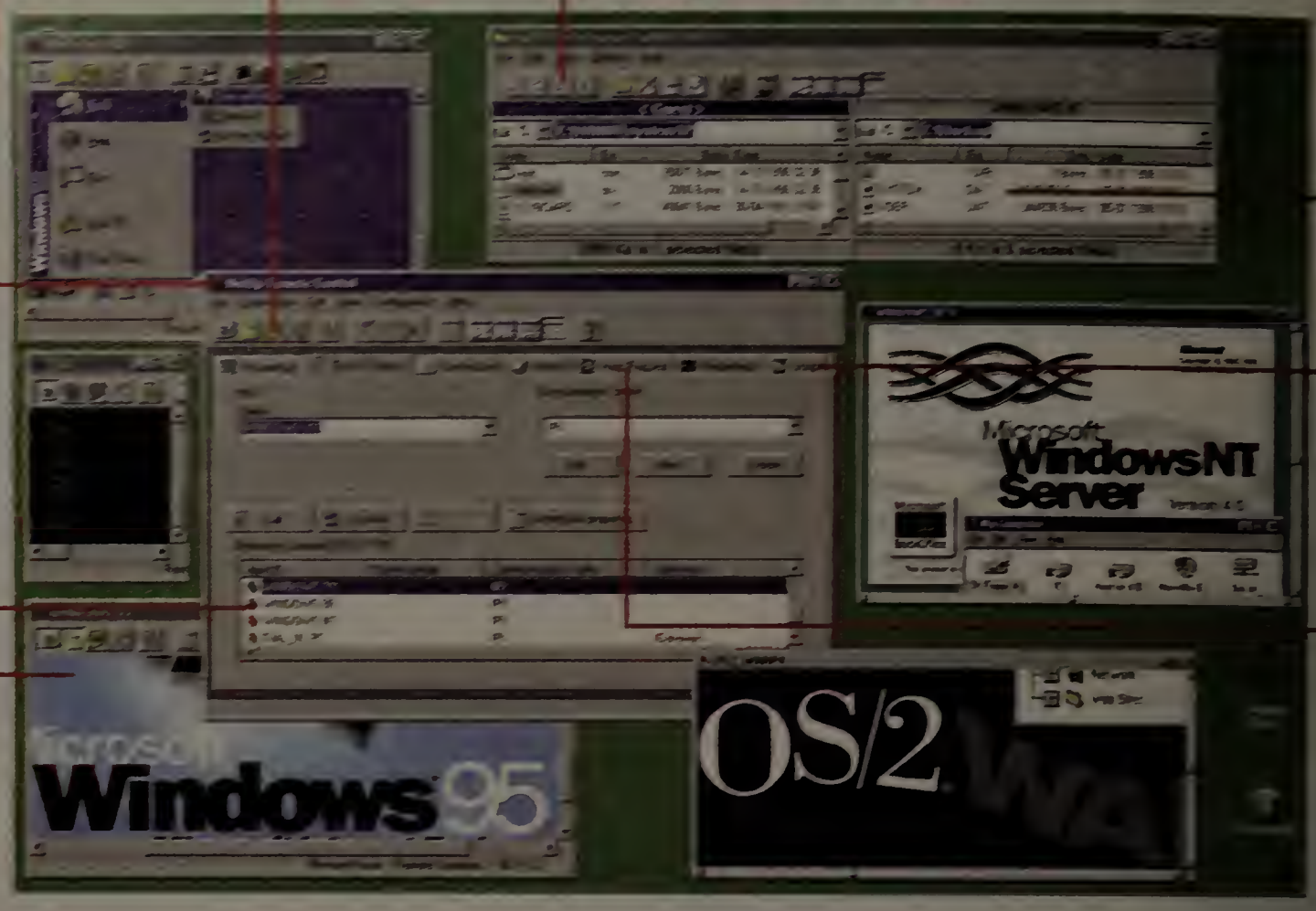

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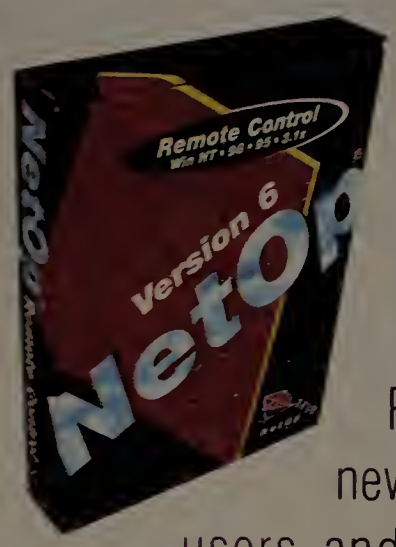

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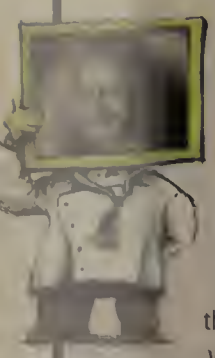


By Steve Blass

In this week's column, I'm updating some of my previous answers. As a follow-up to the Feb. 1 column, in which I described how to provide Internet access in a NetWare environment, a reader asks: How do I connect to the Net using my Novell server with one ISP dial-up account? The answer: Set up TCP/IP on the server, then install the Novell IP/IPX gateway on the server. Connect your modem and enable the serial port. Load the Novell Internet Access Server CD-ROM, and set up your server to dial out to your ISP.

In the March 1 column, for recovering lost NT passwords I recommended the L0pht Crack program or one found at www.nmrc.org/files/snt/bootdisk.bin. Benjamin Webb, a Microsoft Certified Systems Engineer, suggests another: NT Locksmith from Systems Internals (www.sysinternals.com).

In the March 22 column, I said IBM no longer includes online manual pages with the base AIX 4.3.2 server. But Joseph Smith of IBM Global Services says they're on the AIX Version 4.3.2 Base Documentation 55-C34 CD. To use the MANpage system after default installation, add these file sets from the CD: bos.html.en_US.nav; bos.html.en_US.cmds.cmds1; bos.html.en_US.cmds.cmds2; bos.html.en_US.cmds.cmds3; bos.html.en_US.cmds.cmds4; bos.html.en_US.cmds.cmds5; bos.html.en_US.cmds.cmds6; bos.html.en_US.files.files_ref.

As network architect at Sprint Paranet in Houston, Blass understands the strain of developing and managing intranets. Send your problems to dr.intranet@paranet.com.

PNNI: The tie that binds ATM switches

BY MIKE WINSLOW

As the need to link multivendor private and public ATM grows, so does the need to easily configure and run those environments. That's where the ATM Forum's Private Network-to-Network Interface (PNNI) comes in.

PNNI is a routing protocol for ATM that allows for the exchange of routing information between ATM switches.

As a routing protocol, PNNI allows switches in the network to determine the best route to establish a connection. In this sense, PNNI is like other protocols, such as Routing Information Protocol, but differs in that PNNI is a source-routing protocol, rather than a hop-by-hop protocol.

In hop-by-hop style routing, the link that is chosen is decided by each node. In a source-routing protocol, the first PNNI node chooses the path to be taken throughout the network.

ATM is inherently a connection-oriented network and differs from datagram-style networks in that a virtual connection is established through the network before data is sent. In a datagram network, such as in IP routing, each individual data packet contains the address of the destination to which the data is being sent. Routing through the network is done on a packet-by-packet basis. In ATM, the routing decisions are made one time, when the connection is established.

Multivendor switching

PNNI allows for switches from different vendors, or on different networks, to exchange addressing and routing information so those who maintain the network can set up connections with minimum intervention. Before PNNI was accepted as a routing protocol, the standard available for the interconnection of ATM switches and networks was Interim Interface Signaling Protocol (IISP), which was a simple static route type of network.

Static routing in networks requires a relatively significant administrative effort. Defining permanent virtual circuits (PVC) in a network entails defining the link-by-link definitions that constitute the path through the network.

In order to alleviate some of the effort in PVC definition, many switch vendors implement something called switched permanent virtual circuits, which look like PVCs to the subscriber but are actually switched virtual circuits (SVC) within the network.

SVCs are created through the use of a signaling protocol. The connection is established by the network at the subscriber's demand. The subscriber specifies the endpoint address of the connection as well as the type and quality of service required by the connection.

This session is performed within the parameters of the setup message, where the required bit rate, delay and other service parameters are specified.

Address specifications

Addresses in the network can be of three types: E.164, an international telecommunications numbering standard, International Code Designator (ICD) or Data Country Code (DCC), which are ways of identifying oversees numbers. In addition, the subscriber may specify his own End Station ID (ESI) to the network.

Because the network administrator does not necessarily know the ESIs, there must be a way to communicate this information from the subscriber to the switch and propagate the address to other switches in the network.

This is accomplished at the subscriber interface through the use of Interim Link Management Interface address registration procedures. These allow the subscriber to communicate the ESI to the network and receive the network prefix from the network.

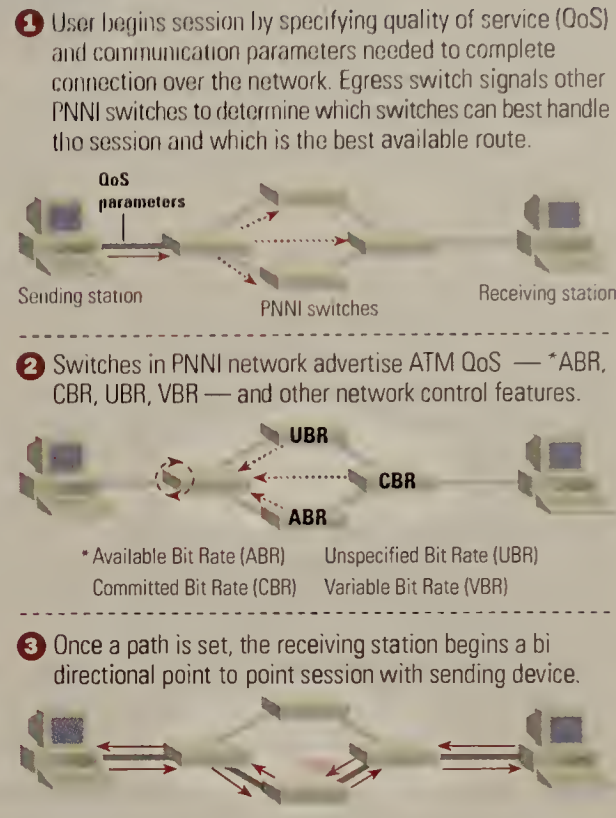
The prefix used by the node connecting to the subscriber is typically unique to the node and is known to the rest of the network. There are three distinct address formats that can be present in an ATM network. When a public and private network connect, how can they interface without redefining the address structure of the network? This problem can be addressed with the implementation of PNNI at the interface between the public and private network.

Winslow is director of products in North America for Radcom, a network equipment test vendor in Mahwah, N.J. He can be reached at Mike_Winslow@compuserve.com.

HOW IT WORKS

Private Network-to-Network Interface

PNNI is an ATM Forum specification that defines protocols that let switches in a private or public ATM network communicate. The PNNI protocol has two main functions: to reliably distribute network topology information so that fast routing paths can be determined to any destination, and to provide a signaling protocol to help set up point-to-point and point-to-multipoint connections. The idea is to enable simple net configurations while helping network executives efficiently manage net resources.



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Gearhead — inside the network machine . Mark Gibbs

TIME WAITS FOR NO MACHINE

Gearhead has recently mentioned time several times and from the response, it may have been timely. So, this week, we'll take a closer look at network time-keeping.

But first, put the following snippet in a file and save the file with the extension "htm" (you could also paste it in the body of an existing Web page):

<applet CODEBASE="http://www.bldrdoc.gov/timefreq/"CODE="utcnist.class" WIDTH="450" HEIGHT="85" IGNORE>

</applet>

Now load that file into your Web browser and, as long as you can access the Internet and run Java applets, you'll see a real-time display of the time at the National Institute of Standards (NIST) with an accuracy of plus or minus one second.This applet is used on the page www.bldrdoc.gov/timefreq/javaclck.htm (I added the CODEBASE argument so that the correct location of the applet can be resolved).

NIST also offers 16- and 32-bit time synchronizing utilities on the same page, but they are rather less sophisticated than the ones discussed in my last column (www.nwfusion.com, DocFinder: 2728)

Underlying these tools are several protocols. The oldest is the Network Time Protocol (NTP), defined in RFC 1305, which you can find at www.cstv.to.cnr.it/toi/rfc/rfc1305.txt. For a good overview of NTP and synchronizing clocks over networks, check out the Executive Summary at www.eccis.udel.edu/~ntp/ntpspool/html/exec/htm.

You may also come across other time protocols, including Simple Network Time Protocol (SNTP), a streamlined variant of NTP. You'll find RFC 1769, the spec of SNTP, at www.cstv.to.cnr.it/toi/rfc/rfc1769.txt.

The idea behind NTP isn't complicated: The client sends a request containing a time stamp — a notation of the client's local time — to a time server. The server responds by adding its time stamp to the packet and sending it back to the client.

The client then subtracts the time stamp it sent out from its current time to estimate the round-trip delay. Next, the client halves that round-trip value and adds that result to the time server's accurate time stamp to derive the correct time. Then the client resets the local clock adjusting for the local time zone.

Of course, the assumption that the round-trip delay is made up of equal outbound and inbound delays isn't necessarily true — the trips across the Internet could be different for each leg.

In short, getting really high accuracy is quite a feat (proving once again that the devil is in the details). But most NTP and SNTP software can easily achieve subsecond accuracy, providing that the time server they reference is at least a "stratum 2 server."

Stratum 2 servers are those that talk to (guess what?) the stratum 1 servers. These servers are directly connected to the really high accuracy atomic clocks. As of early 1999, there were 79 stratum 1 servers worldwide and around 100 stratum 2 servers. While you can access the stratum 1 servers, you are strongly discouraged from doing so because they are under a huge load from the designated stratum 2 servers as it is.

So why is time such a big deal? Well, if you require accurate timing for mission-critical operations, such as air traffic control, you have to build a robust time-keeping architecture.

Of course, in these environments you would want to put a highly accurate and reliable time source directly on the network rather than count on network time servers on the not always reliable Internet. See www.eccis.udel.edu/~ntp/hardware.html for a list of vendors that sell time hardware.

Some other fine time resources online can be found at Yahoo's listing of time-related sites: http://dir.yahoo.com/Science/Measurements and Units/Time/Current Time/.

Sync up to gearhead@gibbs.com.

Network World Fusion

Spotlight

News, tips and tools from our Web site

Building killer Web sites

Those Motley Fools continue their discourse on building a Web site that works. This week's topic is information architecture. You'll read with rapt attention their tips for keeping surfers on your site. First step: Talk to folks in-house about what sort of information they want to get out.

DocFinder: 2725

Domain name and AOL

It's a question some Fusion users are asking in reaction to an article on the future of domain name registration. Under a recently announced plan, ISPs could bundle registration with their other services. But who would own the name if you switched ISPs? Will things get even more confusing? Discuss it in our domain-confusion forum.

DocFinder: 2724

Nutter's Help Desk

This week, Ron Nutter helps a user with two remote locations that keep hanging up instead of staying connected to an NT server at the home office via dial-up networking.

DocFinder: 2735

That missing Gearhead

We know how you can get if you don't get your weekly Mark Gibbs fix. So we apologize for last week's omission. But we did have that killer Network World 200 package to get in, after all. Fear not: we've put the 4/26 Gearhead column online. Read about the nifty new file-compression and time-synchronization apps Gibbs has discovered.

DocFinder: 2728

Career Doctor

What's your workplace personality? Lie down on the couch and tell good ol' Doc Shaun Kelly all about it. He'll tell you what it all means. Plus, read his answers to career questions posed to him last week.

DocFinder: 2729

Download of the week

It never fails. You spend all this time installing software on a desktop and then the browser doesn't load, Word keeps crashing or other disasters ensue.

Enter InstallWatch 1.1, a utility from Epsilon Squared that tracks and catalogs software installations on the Windows platform. The system logs changes to the registry, files and directories, and to .INI files. Its database can be used to print reports and can be exported to HTML format for easier viewing. Users can export registry changes to a .REG file and create install kits.

InstallWatch 1.1 is available for Windows 95, 98 and NT. The fully functioning version is priced at $33. A free trial version can be downloaded from our Fusion Download Area.

DocFinder: 2633

Frame this!

If frame relay is part of your WAN, then you'll want to keep up with what's going on with carriers and equipment vendors. Steve Taylor and Joanie Wexler will help you do that with Network World Fusion Focus on Frame Relay, a free, twice-weekly e-mail bulletin on what's new and interesting in the frame arena. Check out the archive of past newsletters. Like what you see? Sign up for delivery.

DocFinder: 2730

Help Desk

Ron Nutter is standing by to answer your networking questions. Read his column every week on Fusion. DocFinder: 2450

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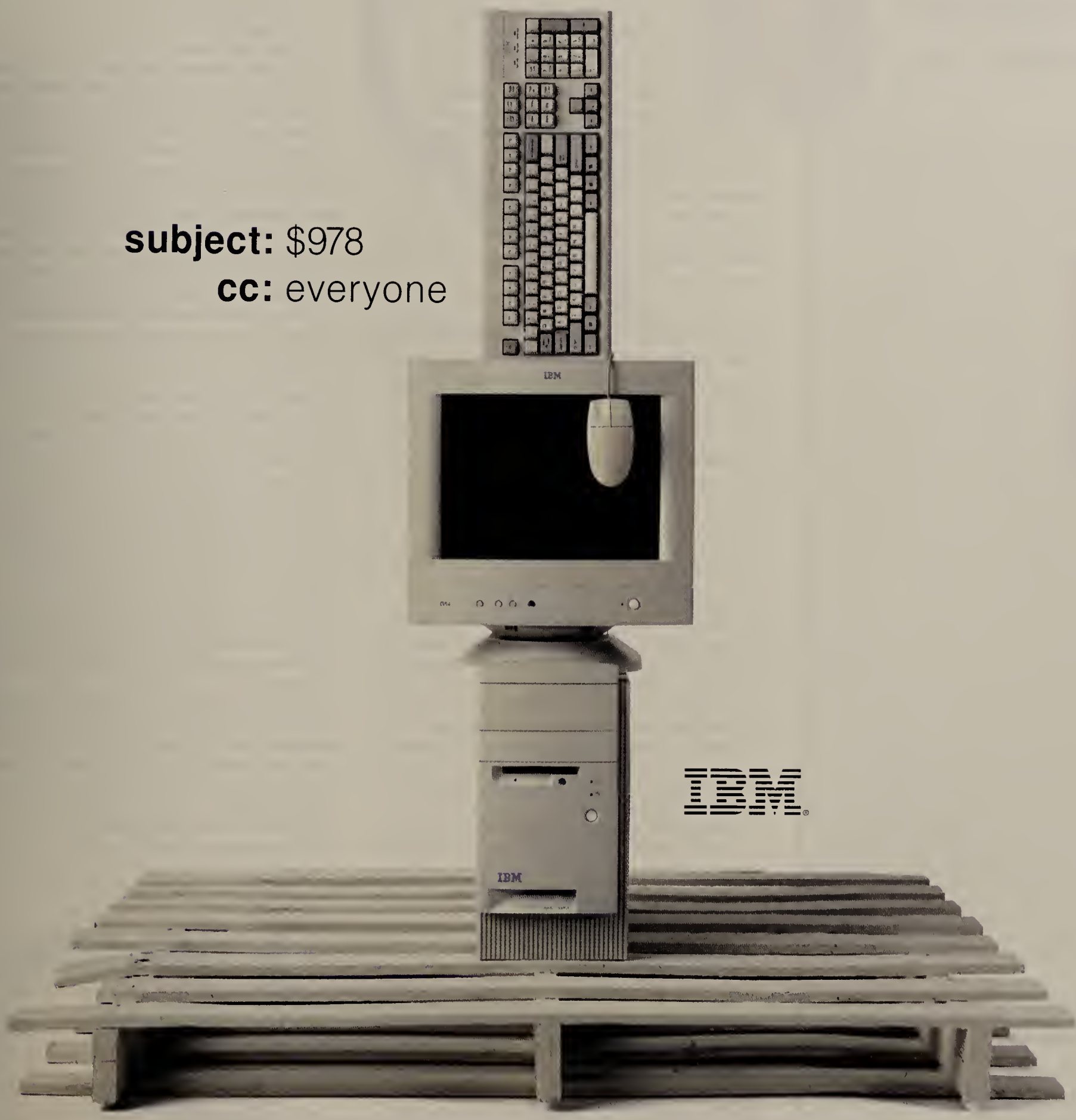
celeron™
PROCESSOR

subject: $978

cc: everyone



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e-business tools

Editorial Insights

Customers should press Cisco to support our Switch Metric test

How is Cisco different from 3Com, Allied Telesyn, Alteon, Anritsu, Cabletron, Compaq, D-Link, Extreme, Foundry, Hewlett-Packard, IBM, Intel, Lucent, Madge, Nbase, Neo Networks, Nortel/Bay, Olicom, Performance Technologies, VIPswitch and Xylan?

Cisco is the only major vendor that won't take part in the Network World/Tolly Group Switch Metric test program. Hardly a leadership position.

The Switch Metric is designed to make it easier for you to buy switches. It determines a relative cost for each gigabit of throughput you're buying, analogous to the cost-per-MIPS metric used to benchmark computers. With vendors these days talking about wire-speed this and wire-speed that, the Switch Metric is a tool to help you sort out competing claims.

Tests are conducted on an ongoing basis, and the results will be available through the *Network World* and Tolly Group Web sites. Our first article on the tests will appear next week, based on examinations of 15 switches from nine vendors. (For details, go to www.nwfusion.com and enter DocFinder: 1235.) NetWorld+Interop has committed to a special session in which Tolly Group experts will showcase our findings.

All the vendors listed above think the Switch Metric is a good idea — except Cisco. Cisco says customers aren't interested in performance tests, but rather want "systems tests" that focus on "robust features and essential functionality to run mission-critical enterprise networks."

"This is analogous to only studying the Colorado River while trying to understand the magnificent ecosystem of the Grand Canyon," one executive told us.

Whew! It's hard to argue against Mother Nature. In fact, we agree that testing those higher-level functions makes sense. We continue to do that. But the Switch Metric is a baseline that will help you determine how solid a foundation all those higher-level functions are built on.

Cisco says you don't need this information. I couldn't disagree more.

If you're a Cisco customer, ask your rep why Cisco won't make your life easier by taking part in the Switch Metric. If you're one of Cisco's competitors, you should be getting every customer to ask that question.

— John Gallant
jgallant@nww.com

Message Queue

DOS DOES RUN

Your article, "Ambitious Windows plan comes crashing down," (April 12, page 10) states: "Many corporations haven't moved to NT because it can't run DOS applications. . . ." This is false.

NT can run most DOS applications and does so just fine. The applications that don't work are those that access the hardware directly. NT prevents applications from accessing the hardware. This is one of the reasons it is more stable than Windows 9x.

Greg Martin
Project manager, systems engineering
Educational Testing Service
Perkasie, Pa.

MIGHT AS WELL BE SPRINGER

I agree wholeheartedly with Mark Gibbs' "Backspin" column "Is Intel headed for Jerry Springer?" (April 12, page 66). Intel's television ads claim the Pentium III somehow makes the Internet come alive. It seems very much alive to me with my Pentium II.

Don Vosburg
Systems engineer
Anixter Networking
Indianapolis

VOICE OF EXPERIENCE

As a former Cisco product manager responsible for the Cisco 2500 family of access routers, I found Kevin Tolly's column, "Access routing reconsidered," (April 5, page 19) interesting.

From my own experience, within Cisco and in the industry at large, the use of general-purpose platforms for routers fell into disrepute for several reasons:

- Limited performance of PC products vs. optimized dedicated hardware.
- Reduced reliability of general-purpose DOS, Windows and NT operating systems vs. embedded systems.
- Increased risk of mechanical failures in floppy disks, hard disks, CD-ROMs and/or other rotational media.
- Low-density form factor requiring increased rack space.
- Primitive "lights-out" remote administration and management.

While the advances in raw processor power clearly provide the horsepower for edge routers in small or mid-size business environments, most of the remaining problems have become worse.

For example, the larger size of NT or Unix operating systems requires hard disk subsystems, while virtually all dedicated-access equipment continues to rely on solid-state flash memory technology for operating system images. Although embedded operating systems such as Cisco's IOS have grown larger and more complex, they are still much more reliable than general-purpose operating systems that take forever to reboot and crash frequently because of memory leaks and other sloppy programming in vendor or third-party drivers and applications.

In addition, most PC-based systems now require not only a floppy disk, but also a CD-ROM drive for software configuration and loading.

However, I believe there is an interesting Trojan horse approach that has been more successful in bringing general-purpose access devices back into the market. Specifically, the recent crop of everything-in-one-box turnkey servers from companies such as WhistleJet, Cobalt, Vertical Networks and others. All of these products incorporate hubs, routers, e-mail servers and Web servers, and some also include voice mail and a PBX. One has to wonder whether the customers of these systems realize just how much of their critical infrastructure is now dependent on a single one-box-does-it-all solution.

Our industry goes in cycles between the concept of all-in-one wonderboxes and best-of-breed mix-and-match. It is not clear that either approach is better, and I believe there is room in the market for both types of products.

Robert Spivack
Vice president, sales and marketing
SPIV Technologies Group
San Jose

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

Totally Unplugged . Ira Brodsky

THE CASE AGAINST MAKING MONEY THE OLD-FASHIONED WAY

Industry analysts predict Internet electronic commerce will grow to as much as $3 trillion by 2003. But few people realize the full implications.

According to venture capitalist Michael Hentschel of Techvest International (www.techvest.com), intelligent price agents will gradually turn the entire Internet into a real-time auction. What does this mean? "The inexorable drive toward cost and below-cost pricing will force businesses to invent new ways to make money," Hentschel says.

It's already happening. Internet superstore Buy.com is selling goods at cost. Most observers assume it plans to make its profit from advertising. My experience: Buy.com makes its profit off inflated shipping and handling charges. Other vendors sell below cost. For example, Free-PC plans to give away thousands of PCs to qualified applicants who will then have to view ads targeted to them on their computer screens.

Then there are auction sites, such as eBay, and reverse auction sites, such as Priceline.com. In a reverse auction, the customer states how much he is willing to pay for an item or service. The sale is consummated if a merchant accepts the bid within a predefined time period.

Many of these businesses are simply experiments, but I wouldn't be too quick to dismiss them. Where there are funds, there are successful people investing in what they perceive to be viable business plans. Still, many issues need to be sorted out. Portals hope to make money through ad sales; others sell software that removes banner ads from the screen.

I'm not suggesting all conventional businesses must succumb to new Internet-based competitors. People will still want to see and try on certain types of clothing before they buy, and there is no technology in the pipeline to let restaurants transmit hamburgers over the 'Net. What I am suggesting is that even clothing retailers and fast-food restaurants must migrate information-intensive pieces of their operations to the Internet. Indeed, business-to-business transactions are expected to account for 80% of Internet e-commerce.

This migration of certain business processes to the Web is well under way. Dell sells $14 million per day on the 'Net. Cisco says 73% of its business is now conducted via the Web. Oracle is even renting software over the Internet.

Businesses often depend on long-standing barriers to entry, many of which are about to fall. AltaVista's language function can translate Web sites to or from English, German, French, Spanish, Italian and Portuguese. How long will it be before real-time translation software lets anyone enter the import/export business?

Back-office software will make e-commerce Web sites incredibly powerful. To visitors, the site appears simple and easy-to-use. But behind the scenes, the site continually gathers data about individual users, presenting them with personalized screens and content. Ads will be targeted with unheard-of precision.

Making money the old-fashioned way used to be a virtue. Now it's just a sign of obsolescence.

Brodsky is president of Datacomm Research Co., a consultancy in Chesterfield, Mo. He can be reached at ibrodsky@datacommresearch.com.

Legal issues . Cem Kaner and David L. Pels

A BAD LAW THAT PROTECTS BAD SOFTWARE

At this point in your career, you've probably encountered more than your fair share of software that suffers from poor documentation, inadequate attention to interoperability and known bugs. If so, you need to know about the Uniform Computer Information Transactions Act (UCITA), which software publishers are pushing in order to head off lawsuits from unhappy customers.

Under UCITA, software publishers would have no duty to check their products for viruses. Furthermore, vendors could avoid paying for damage caused by a virus by including a simple disclaimer of implied warranties in a product's documentation, which you don't even see until you've bought and installed the product. (No other industry in the U.S. gets to enforce post-sale warranty disclaimers.)

In addition, UCITA would do the following:

- Redefine "material breach of contract" to make it harder to return a defective product. Software publishers would be allowed to include a clause in the contract (which you never would see before the sale because it's contained within the shrink-wrapped package) that said you could not cancel the contract and demand a refund even if the product was worthless.
- Let software publishers charge users a nonrefundable per-minute fee for technical support, even for defects that were known at the time of shipment.
- Authorize restrictions that would make it harder or impossible for customers to obtain third-party maintenance (such as for fixing Y2K-related bugs, even if the original vendor was too busy to help) or transfer packaged software (when Company X is sold to Company Y, Y may have to pay new license fees for each copy of each piece of software on X's machines).
- Authorize "time bombs" that would automatically shut off the software at a given date unless a license renewal fee was paid and registered. UCITA also would allow a vendor to send a message to your computer to shut down your copy of its software, possibly shutting down your business at the same time. You could collect damages if the vendor sent the message in error, but only if you responded to a warning message from the vendor in just the right way.

Until recently UCITA was called Article 2B and was a proposed amendment to the Uniform Commercial Code (UCC). All amendments to the UCC must be co-sponsored by the American Law Institute (ALI) and the National Conference of Commissioners on Uniform State Laws (NCCUSL). Last month, the ALI withdrew from the Article 2B process, thus preventing 2B from becoming a UCC amendment. However, NCCUSL has decided to promulgate the rules outlined in 2B as a freestanding act, UCITA, for adoption by states.

Not surprisingly, even though NCCUSL is a neutral and well-respected legislative drafting organization, the open-to-the-public drafting meetings for Article 2B/UCITA have been dominated by lawyers representing software publishers.

We started attending these meetings three years ago, seeking compromises to reduce customer risk without imposing hard-to-manage risks on publishers. There have been big clashes and loud debates, but often it's the little things that tell you about the people with which you're negotiating. For example, at one meeting, one of the 10 NCCUSL members commented about user errors made by "dumb customers." A lawyer representing several publishers replied, "Dumb customers? That's redundant!" Almost everyone in the room seemed to think this was hilarious.

The last publicly open Article 2B/UCITA drafting committee meeting was held in February. At the NCCUSL national meeting in Denver this July, UCITA will be submitted for approval. If it passes there, it might go to the state legislatures as early as October. And if UCITA passes in a few states, publishers will be able to make it the law that governs their contracts in all states.

Writing a law that makes it almost impossible to sue software publishers for defects is a poor way to manage the escalating level of software customer dissatisfaction with bad software and bad support. But without opposition from more businesses, that law will pass.

If you want to have your say about UCITA, here are some things you can do:

- Send a letter to Gene Lebrun, president of NCCUSL, P.O. Box 8250, Rapid City, SD 57709. E-mail can be sent to glebrun@lynnjackson.com. (Please send a copy to kaner@kaner.com.)
- Attend the national meeting of NCCUSL in Denver, July 23 to 30. For more information, see www.nccusl.org.
- For UCITA status reports and other suggestions, check our Web site at www.badsoftware.com.

Kaner is a Silicon Valley-based attorney and software development consultant. Pels heads customer operations and support for the high-technology division of a leading automotive diagnostics company. They are the authors of Bad Software: What To Do When Software Fails. *They can be reached at ucita@badsoftware.com.*

Networks OF THE FUTURE

Feature

Our panel of prognosticators gazes into the crystal ball and conjures up images of corporate computing in the year 2009.

Think back 10 years. The World Wid Web didn't exist. The notion that you could do business over the Internet was ludicrous. There was no HTML, no browser, no Java. For that matter, there was no Windows operating system, there were no laptops or PDAs, no Fast Ethernet (never mind Gigabit), no frame relay or ATM, no DSL or cable modems. The big news in 1989 was the introduction of the 33-MHz chip, 16M bit/sec token ring and fractional T-1s. If you could have predicted in 1989 all that's happened in the 10 years since, you'd be far ahead of the game today.

With that idea in mind, we assembled an all-star group of forward thinkers to help paint a picture of the corporate network of 2009. In the stories that follow, you'll find out what futurists, leading lights at major research labs, technology shapers at established vendors and innovative startups, and strategists at major user companies expect will be the big trends of the next decade. Along with their predictions, the team offers concrete recommendations that will help you prepare for the years ahead.

BY NEAL WEINBERG

We all know things are changing fast in the world of enterprise network computing, but you are nonetheless charged with making technology decisions today that your company will have to live with tomorrow.

To make sure you don't get blindsided by technological shifts, we asked leading technology pundits and futurists, people who make a living thinking and writing about technology, to identify five major trends that will shape the industry over the next decade. No one can predict the future, but these folks are paid big money to try. What follows are their insights.

1. Decline of the desktop.

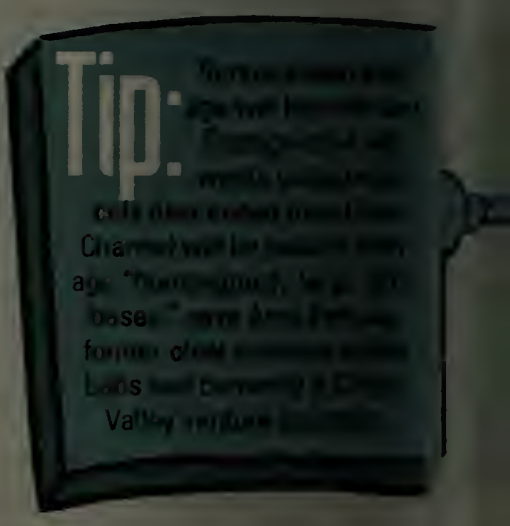
Futurists argue that the pendulum has already begun swinging away from the PC and back toward the server, reversing the tide of the PC revolution, which shifted power from the mainframe to the desktop.

"It's fair to say we may have peaked in terms of how much is going to get loaded on the desktop," says Peter Huber, a lawyer, author and telecommunications specialist who writes a regular column for *Forbes* magazine. PCs certainly won't disappear. But 10 years from now, people will be using lots of other types of computing devices along with desktops, including handhelds and even miniature "wearable" computers.

Data storage and synchronization, plus more advanced features such as scheduling, will likely occur at centralized server farms that connect the corporate office and remote workers via broadband links.

Paul Saffo, director of the Institute for the Future in Menlo Park, Calif., goes along with that vision: "The PC-centric order is tottering and definitely giving way to something new. You can feel the center of gravity moving inexorably toward something where OS-based desktop PCs become steadily less important." Conversely, he says, IP networks will become steadily more important.

The concept of monolithic, PC-based applications for functions such as human resources and accounting will give way to a more dynamic notion of a tool kit for a particular task, Saffo predicts. Employees will be able to pick and choose from a menu of specific software tools to complete a particular project. Some of those tools will live on the desktop, but others will live on the network.



Bob Metcalfe, Ethernet inventor and industry pundit, argues that 10 years from now, PCs will be the exception rather than the rule, "with Wintel machines only a bit more important than punched cards today." He sees PCs being knocked off their perch by network computers, Internet appliances (which would include anything from telephone-like devices to televisions), and nondesktop computers, such as enterprise servers and wearable computers.

2. The Internet will rule.

Ten years from now, at least half of all business transactions will take place online, predicts Ray Kurzweil, a pioneer in print-to-speech reading machines and speech recognition technology.

Issues such as security, authentication and quality of service (QoS) will all have been solved

says Internet guru Esther Dyson, chairman of EDventure Holdings in New York. The Internet will be "the basis of everything," she says.

The distinctions between intranets, extranets, the public Internet and corporate nets will disappear. "In 10 years, it's safe to say, corporate networks will have fused with the Internet," Metcalfe says.

David Isenberg, a former Bell Labs engineer who is now an independent consultant, goes even further, arguing that the current Internet may someday be superceded by what he calls the "stupid network." Isenberg says current efforts to add QoS features to the Internet are misguided because they are based on the notion that bandwidth is in short supply and needs to be managed and conserved. His view is that through technological advances, bandwidth will become abundant and inexpensive.

When that happens, Isenberg predicts, a new, stupid network may develop that has no QoS features and simply moves bits, with all of the intelligence residing on the end user's device. In his scenario, the QoS-based Internet will be used for established applications, but the stupid network is where innovation will occur.

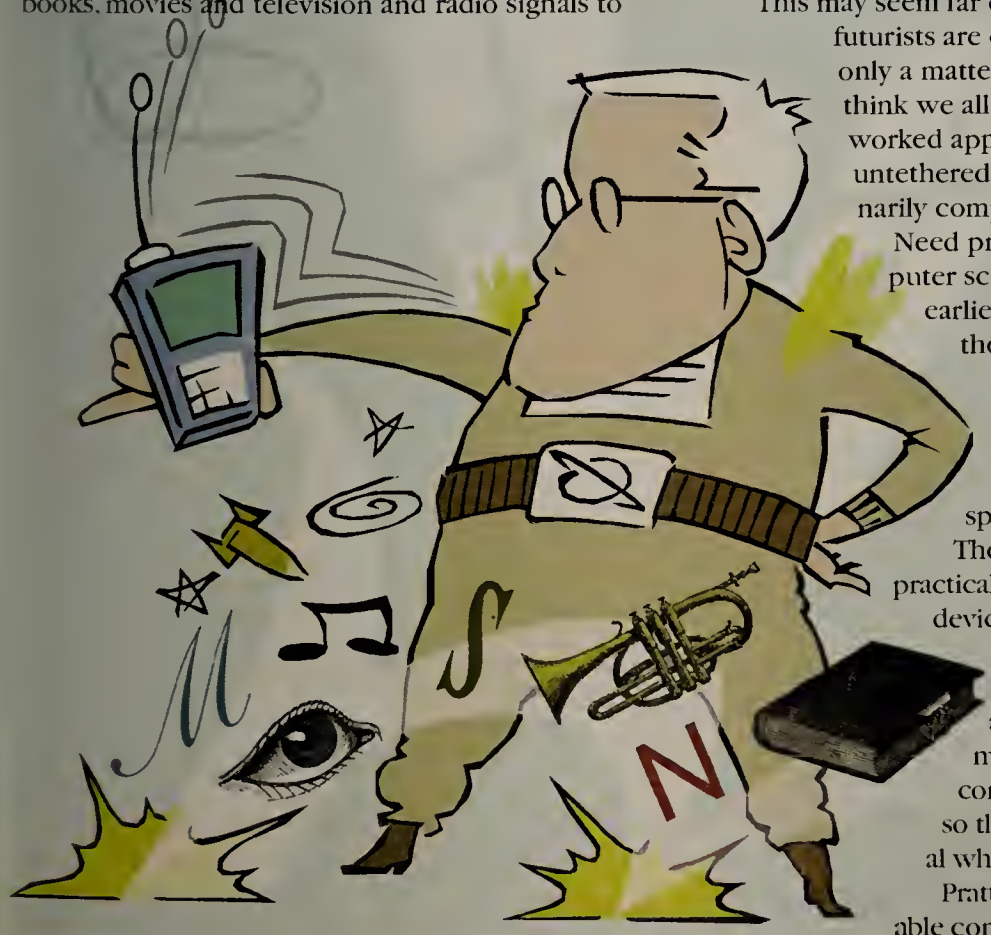
Tip: "Anybody who is not investing whole hog to build electronic chains of communication all the way from the customer to the person who's mining the iron out of the ground is going to be wiped out by the people who are," telecom specialist Peter Huber says.

3. It's a wide, wide wireless world.

Up to now, wireless has gone pretty much nowhere. Ten years from now, it will be everywhere. Constant wireless connectivity will be taken for granted, Dyson predicts. Arno Penzias, former chief scientist at Bell Labs and current venture capitalist, concurs. Employees will be able to work from home, hotels, roadside rest areas, or wherever they happen to be, and tunnel into the corporate net through virtual private networks, he says.

Most landline telecommunications will be replaced by wireless communications that will include high-resolution moving images, Kurzweil predicts. Wireless will allow people scattered all over the world to easily conduct meetings. Corporate travel will plummet.

The convergence of video, voice and data will have taken place, and consumers will be able to download books, movies and television and radio signals to their portable communications devices over broadband wireless links.



4. Computers will be everywhere.

By 2009, you'll be walking around with maybe a dozen tiny computers on your body. They will be embedded in your clothes, in your watch and in your earrings. These tiny computers, many with specialized features such as high-resolution displays, speech or speech-recognition capabilities, will be linked together into a body LAN.

You might wear a pin that contains a personal identification chip that will allow you to use an ATM machine or get through the front door at work. The navigation systems now being installed in cars could be included in your new watch. Your jogging shorts may come equipped with tiny computers that monitor your heart rate and notify you if you're starting to overdo it.

You'll probably be wearing a tiny computer that allows you to surf the Web. Communications devices such as pagers and cellular phones will be miniaturized. Another computer may keep track of your daily schedule. All of these devices could be linked to an earpiece that delivers voice messages and to eyeglasses that display text.

Your home will be even more well-equipped. The average household will have more than 100 computers, Kurzweil predicts, and each house will have its own server. Computers embedded in security cameras, motion detectors, lights, alarm clocks, heating and cooling systems, refrigerators, microwaves, communications devices, PCs, televisions and VCRs could all be linked to the server. You could be at work, connect to your home server and control all of those devices remotely.

This may seem far out, but the futurists are convinced it's only a matter of time. "I think we all agree that networked appliances will be untethered and extraordinarily compact," Penzias says.

Need proof? Stanford University computer science professor Vaughan Pratt earlier this year created a Web server the size of a matchbox using off-the-shelf components. It uses a wireless modem to connect to the Internet and connects to a display that is viewed using special glasses.

There is seemingly no limit to the practical applications of wearable devices. According to Neil Gershenfeld, who co-directs the Things That Think research consortium at the MIT Media Lab, airline mechanics are starting to wear computers linked to display glasses so they can read from a repair manual while keeping both hands free.

Pratt predicts that in 10 years, wearable computers will be common in the business world to support applications for which people now use personal digital assistants — planning and scheduling, reporting and information exchange.

Saffo adds that the proliferation of inexpensive analog sensors, based primarily on MicroElectro-Mechanical Systems (MEMS) technology will allow networks to collect all kinds of information. Imagine that every fryolater at McDonald's has sensors that monitor how well the fries are being cooked and report back to a central server dedicated to quality assurance. Saffo says these analog sensors will pave the way toward incredible manufacturing efficiencies, mass customization of goods and "consumer connectivity like you never imagined."

Tip: Buy into standards-based products and wait for the bugs to be worked out of first-generation products, Huber says. Also, wait for the market to generate enough volume so prices are dropping.

5. Convergence of man and machine.

Today, people and computers inhabit parallel universes: People live in a sensory-rich, physical, analog world; computers live in a deaf, dumb and blind digital world.

"That's going to change," Saffo predicts. "We're going to put eyes, ears and sensory organs on our computers and our networks in absolutely unprecedented ways. We're going to ask them to observe and manipulate the physical world on our behalf."

By 2009, Kurzweil predicts, computers will come with built-in video cameras and will be able to identify their owner by face. Advanced speech recognition software will be commonplace, and the majority of text will be created by humans talking to their computers rather than typing.

The graphical user interface will be replaced by the LUI, a language user interface. When talking to their computers, Kurzweil says, people will interact with "an animated personality," or a simulated person. Intelligent software assistants will routinely find information, answer questions and conduct simple transactions on behalf of their owner.

If all this sounds overwhelming, Pratt offers this bit of advice: "Relax, the changes aren't going to come all at once."

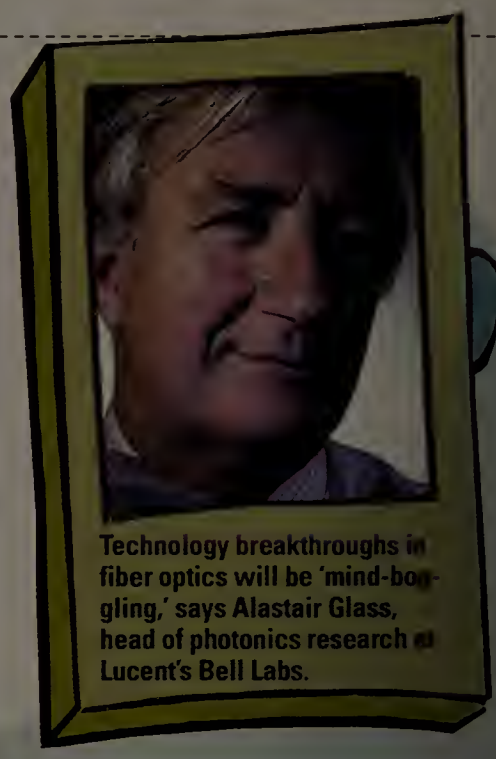
Finally, Dyson says that in this fast-paced world it will be difficult to gain a sustainable advantage over your competitors. Her advice for keeping ahead of the pack is a timeless one: "Hire good people."

VENDOR VISION

The future holds a world of virtual workplaces, network dial tones, information appliances and self-healing systems.

"The computer revolution hasn't even begun. We'll look back on this time like the history of cinema before projectors, when people watched flip-screen shows."

Marc Smith, sociologist, Virtual Worlds Group of Microsoft Research



Technology breakthroughs in fiber optics will be 'mind-boggling,' says Alastair Glass, head of photonics research at Lucent's Bell Labs.

DOUGLAS LEVERE

BY MICHAEL CSENGER

Some people call it convergence. 3Com Chief Technology Officer John Hart refers to it as the unified field theory of networking. Others talk about pervasive computing.

No matter which buzzword you prefer, it's clear that the major network vendors, fueled by technologies brewing in their research labs, are preparing to roll out products and services over the next decade that will dramatically transform the corporate network.

"People are thinking of this as a minor thing, an improvement over what we have now, which is the wrong way of looking at it," Hart says. "There's nothing minor about it — everything will change."

And driving those changes will be technological advances in areas such as fiber optics and wireless communications. Alastair Glass, head of photonics research at Lucent's Bell Labs, says that a single optical fiber today can carry 400G bit/sec. That capacity is doubling every year.

"In 10 years, we'll reach the theoretical limit of how much information photonics can carry — 1,000 terabits per second on a single fiber — which is mind-boggling," Glass says.

Lucent and other companies are also working on a new fiber topology that uses intelligent optical switching to provide full network meshing and packet switching over fiber. "The bandwidth will be there; how we'll use it is the biggest unknown," Glass says.

Even as fiber-optic wires deliver bandwidth to the network backbone, wireless technology will stretch the boundaries of corporate nets, making them increasingly "free-form, amorphous and liquid," says Steve Mann, vice president of product strategy for Computer Associates.

Breakthroughs in spread-spectrum technology are expected to push wireless into the mainstream. "You'll see wireless able to bring connectivity to every user across the planet at up to 1G bit/sec each, all at the same time, with no interference," says Marc Smith of Microsoft Research.

This will alter every concept of employee mobility and the virtual workplace. "The network ultimately comes down to a handheld device that combines telephony, data and multimedia functions," says Rob Zimmer, director of networking strategies at IBM's Network Hardware Division.

IBM and others are pushing to develop these permutations of notebook computers, personal digital assistants (PDA), cellular phones and pagers that can run business processes from wherever end users happen to be, Zimmer adds.

"The face of networking can become the face of any device I own — a TV, my clock radio, a handheld computer or the dashboard of my car," says Paul Doolan, vice president and CTO of Ennovate Networks.

Smith, the first sociologist hired by Microsoft to explore the concept of social computing, adds, "With things like wearable computers, cyberspace will be around and between us all the time, and every object will have an information halo accessible by any device."

If this vision of employees scattered everywhere connecting to the network over new and strange devices seems at odds with the notion of a single, unified, converged network with everyone running IP, that's because it is.

In fact, technology visionaries at major network companies recognize this fundamental dichotomy and are addressing it.

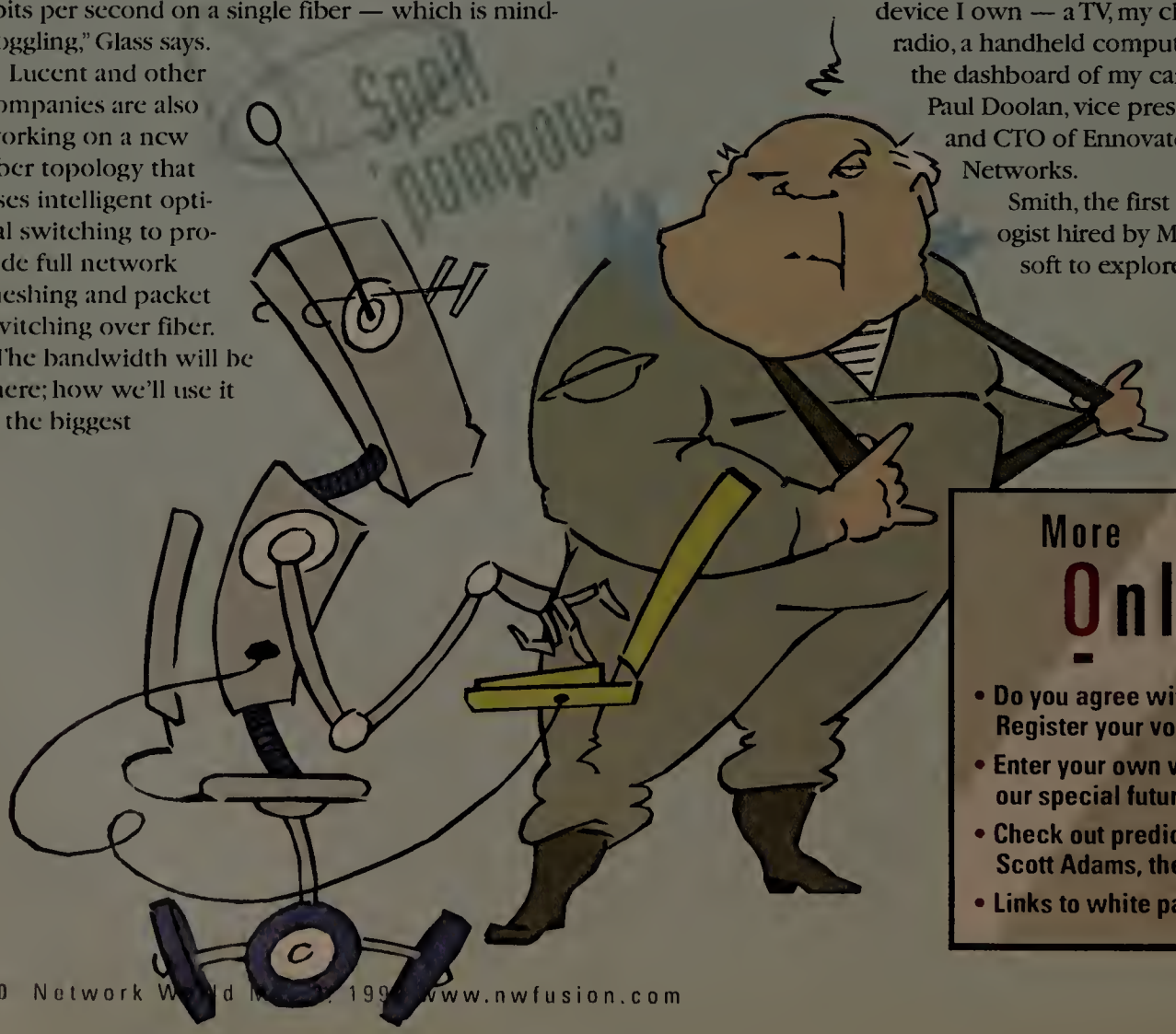
"When you look at mobility and wireless [technology], there's nothing homogeneous about the market," says Denise Lahey, vice president of mobile and embedded products for Oracle. "You have information appliances — handheld computers and PDAs — all with different form factors and different browser interfaces. Trying to network them is not like trying to network 300 million PCs that all happen to use Windows."

Oracle is developing a middleware architecture that will allow pervasive wireless networking of these various devices and the applications that will be run on them. "You'll carry a handheld device that automatically synchronizes itself with applications on the corporate network," Lahey says. "When you're traveling on business and you enter a hotel or get off of a plane at the airport, [the device] will connect to wireless services that update your schedule and automatically make airline or hotel arrangements for the new meeting you have to attend tomorrow."

"You need a middleware infrastructure that can make all of the different networks and network services appear as one to the user," adds George Vanacek, chief scientist for the IP Technologies Organization at AT&T Labs. And that remains a work in progress. "We know how to go about it on any homogeneous system, but when you look at the scope of so many different technologies and services, we don't have anything in place."

What's likely to happen is that this middleware will wedge itself in between the hardware and the software of switches, routers and operating systems, says Marc Christensen, vice president of Intel's Network Communications Group.

End users will encounter a simple, network dial tone, the converged network equivalent of the telephone dial tone, with advanced features such as security, directory services and intelligent quality of service hid-



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ing in the background. "All you want the user to worry about is getting on and off of the network," Christensen says.

Convergence, in other words, will be an illusion. It's an external perspective from which users see any service they want in the network. "But to actually deliver those services, we'll explore the hell out of every resource we can," 3Com's Hart says.

IP will be a popular protocol but it won't be the only one, says Jeff Baeher, Sun's chief networking officer. "What you'll see instead is people leveraging all of the different technologies and transmission options. The main function of the network won't be routing; it'll be transcoding between all these devices and technologies." For example, when an end user is on a PalmPilot with a black and white screen, the network will know not to send a color JPEG, Baeher says.

For that kind of network intelligence, systems management has to rise to a whole new level. "We need to move away from counting packets to modeling trends before they occur," Baeher says.

Self-aware, self-healing networks of the future will rely on artificial intelligence. CA is the first software vendor to provide network management applications based on neural-network technology. Its "Neugents" are able to learn how a network behaves and can predict impending problems based on that behavior.

"We've got the prediction part of it down, but humans still have to engage in order to fix the problem," CA's Mann says. "In 10 years, we'll see neural-network applications that not only predict potential problems and provide diagnostics but can actually go ahead and implement procedures to heal the situation."

Pete Solvik, chief information officer at Cisco, adds, "Instead of provisioning dumb pipes and then digging into bits and bytes when the system doesn't work, network managers will work with a whole new set of tools at the network services layer."

And for network executives who might feel overwhelmed by all these changes, outsourcing will become an increasingly attractive and viable option.

Zimmer says that traditional and nontraditional carriers, realizing that profit margins on simple bandwidth services will be thin, are evolving into what he calls application service providers.

"These are organizations that don't necessarily have to own network infrastructure," Zimmer says. "Their focus is on enabling business processes on any network."

He predicts that corporations will begin down the outsourcing path with standard applications such as e-mail or off-the-shelf human resources packages, then business users will ultimately outsource day-to-day applications to whomever can do it for less.

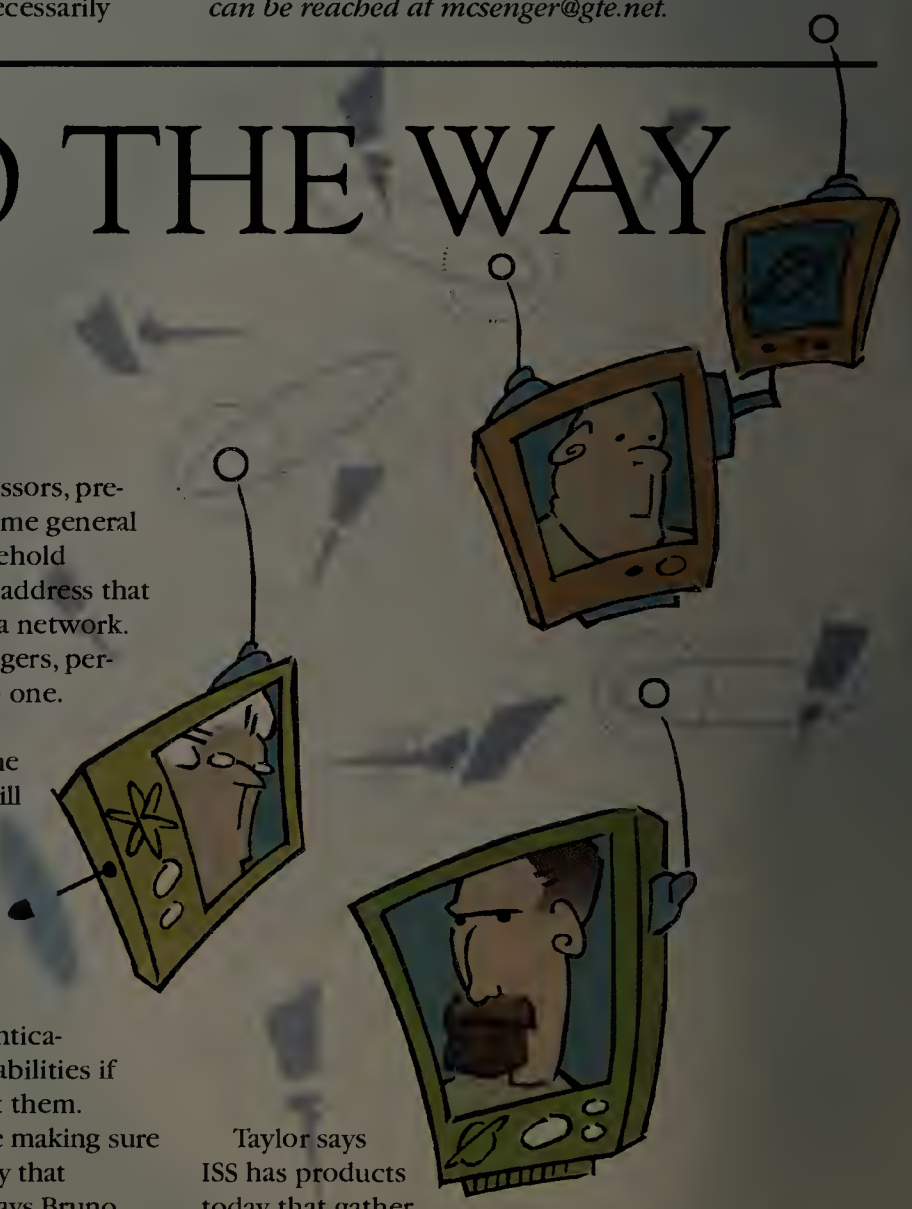
"Web-site hosting is already a $3 billion market, and over the next two or three years the same economic drivers will move every fundamental business process onto the Web," Zimmer says.

Ennovate's Doolan takes this vision of outsourced network services even further: "You'll have a marketplace of full-service communications, content and data-management players who'll outsource everything for you. You'll work through an interface that talks to you and moves around on your screen — think of the baby on the show 'Ally McBeal' with a Cray for a brain and gigabits of I/O."

Csenger is a freelance writer living in Hawaii. He can be reached at mcsenger@gte.net.

START-UPS LEAD THE WAY

Innovative newcomers are developing key pieces of the puzzle.



BY APRIL JACOBS

Some of the most exciting new technologies are being developed in the labs of innovative start-ups.

Sycamore Networks, Inc. is offering the promise of inexpensive, virtually unlimited bandwidth through optical switching. Desh Deshpande, Sycamore's founder and chairman, predicts that within a few years, fully meshed, packet-switched, optical networks will be widely available and easy to provision. "You'll see OC-48 (2.5G bit/sec) services become like the T-1s of the '90s."

For a fully functional network, you need hardware, software and end-user devices that can take advantage of that type of bandwidth.

Juniper Networks, Inc. is developing powerful routers designed to carry converged voice, data and video. "Today we are shipping boxes that can handle one million voice calls per second — and if that is the reality today, then the reality in 10 years is devices with 100 times that capacity," says company spokesman Joe Furgerson.

He adds, "Voice calls will be an interesting legacy application — you really will be able to click and shoot and see people, and voice mail will be as much for video clips as voice, or even picking up applications and files."

Varad Srinivasan, chief technology officer at NetLogic Microsystems, Inc., one of the new breed of fabless semiconductor companies that design specialized processors, predicts that some devices will retain the same general form but will become smarter — a household microwave containing a chip with an IP address that allows it to be controlled remotely over a network. And other devices — cellular phones, pagers, personal digital assistants — will merge into one.

"Bandwidth will be less of an issue," Srinivasan says. "You will be able to turn the heat on and off from work because you will have a mini-router in your house. Just like we have electric motors in everything, the routers and hubs we see in offices today will be in houses, and they are all going to be talking."

Those new household and office routers will have to have superior authentication and encryption capabilities if people are going to trust them.

"The challenge will be making sure that you connect in a way that nobody else can listen," says Bruno Couillard, CTO at Chrysalis-ITS, Inc.

His company is developing a variety of security products, including encrypted PC tokens that work with digital certificate-enabled desktops.

With that much dependence upon the network, performance becomes even more critical. Enter the self-curing network, smart enough to figure out it has a problem and smart enough to fix it.

Patrick Taylor, vice president of strategic marketing at Internet Security Systems, Inc. (ISS), says his company is focusing on just such technology.

Optical switching will provide virtually unlimited bandwidth, says Desh Deshpande, founder and chairman, Sycamore Networks, Inc.

Taylor says ISS has products today that gather information about vulnerable spots in a network, analyze threats and help network managers prioritize problems.

"Today, I can see an attack and I can send a message that tells a firewall to shut down," Taylor says. "In the future I will have to figure out more based on the whole idea of electronic commerce and virtual corporations. The servers at the heart will always be there, but the boundaries will be nonexistent."

His prediction is that networks will be equipped with sensors that will interact with smart programs to enable the network to dynamically make decisions and change configurations.

Jacobs is a freelance writer living in Dover, N.H. She can be reached at ajacobs777@aol.com.

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GO BOLDLY

Leading-edge corporate users recommend an aggressive approach toward adopting new technologies.

BY ELISABETH HORWITT

Bandwidth is cheap; end users are mobile and connected; convergence of voice, video and data has occurred; and core network services are being handled by outsourcers.

That's the future, according to corporate technology visionaries. They say it's too early to lay down all your chips on any particular technology, especially in emerging areas such as last-mile broadband connectivity or wireless access devices. But now is the time to put on your game face, take an aggressive stance and begin laying the groundwork.

Gary Habermann, director of technical resources at Widener University, installed an ATM infrastructure in 1996 to stay ahead of the competition.

"You need to be bold in your forecasts of what technologies will change the marketplace," says Gary Habermann, director of technical resources for Widener University in Chester, Pa. "We put ATM in in 1996; now we have the infrastructure we need to deploy competitive technologies ahead of our competitors."

Within three years, Widener's ATM backbone will be carrying voice, data and video traffic. The university's security, heating and cooling systems will also be on the converged network. And the ATM LAN will provide a staging ground for classes presented to remote students over multicast video.

Indeed, corporate visionaries say that technology-driven advances, particularly electronic commerce, will fundamentally change the way companies do business in virtually every industry.

In fact, information-intensive fields, such as publishing, education and financial services, are already being affected by the fact that the Web provides a vehicle for distributing information at practically no cost. "The e-commerce environment will remove a large percentage of how certain industries add value," predicts Dave Anderson, Amdahl Corp. chief technology officer.

For example, as shopping online becomes the norm rather than the exception for a broadening segment of the retail industry, physical stores will either vanish or change into something fundamentally different. "Bookstores like Barnes and Noble will become entertainment destinations where friends can meet over a latte, or attend a book discussion group," Anderson says.

Savvy companies will anticipate these changes and redefine themselves to stay viable in the emerging e-commerce environment. And network technology will drive those changes.

For example, the electronic movement of documents is eating into the letter and document delivery business, says Doug Fields, vice president of application development in marketing, customer service and telecommunications at United Parcel Service. So UPS is aggressively exploring how it can add value in this area: for example, guaranteeing security, confidentiality and end-to-end delivery of electronic documents.

In the health care field, HealthData Resources is developing technology that will allow hospitals to deliver health information to corporate and individual clients over the Internet, according to Ed Risinger, the company's president. In 10 years, Risinger predicts, patients will be able to download from the hospital the information they need to make an informed choice about treatment based on their individual profile. Right now, HealthData is pilot-testing services on the existing cable-television infrastructure in hospitals, so that the technology will be ready to go wide-area as soon as broadband becomes inexpensive and available to the home.

Smart companies in a wide range of industries are racing to position themselves to provide multimedia, interactive, specialized information services. Already hot, this market may explode once consumers have their last-mile broadband connections and multifunctional consumer access devices, executives predict.

And as WAN costs become increasingly negligible, not only information services but application processing will become increasingly centralized — and outsourced.

"The information processing will be done by a service, rather like the old-style service bureaus," Anderson says. "Companies won't need to own and maintain computing and storage devices." And firms will be able to offload the costs of rolling out and maintaining enterprise applications.

Textron outsourced parts of its network to AT&T Solutions two years ago, and Textron's chief information officer, Bill Gauld, says outsourcing of applications is just the next logical step: "We no longer own our telecom assets. There's nothing on our books, so we are not limited or constrained in what we use. We just look at cost of technology and whether it addresses a business benefit — we don't have to put five years' depreciation of legacy routers into the equation."

He adds, "With bandwidth plentiful and services delivered via a common user interface, you can make decisions about where to put applications without worrying about technical or network limitations." And Textron doesn't have its assets tied up in network gear.

Users will benefit from thin clients and centralized services by finally having access to application and information services from anywhere in the company — or ultimately, the world.

"Anything I keep on my desktop has geographic immobility," Anderson says. "I'd much rather be in a situation where I can [plug in] and pick up information or schedule appointments or send a file from wherever I am."

And IT will finally get that humongous budget item, user system maintenance, under control. "If something screws up, you just push the reset button and your software is automatically reinstalled from a central place," Anderson says.

Horwitt is a freelance writer living in Waban, Mass. She can be reached at ehorwitt@compuserve.com.

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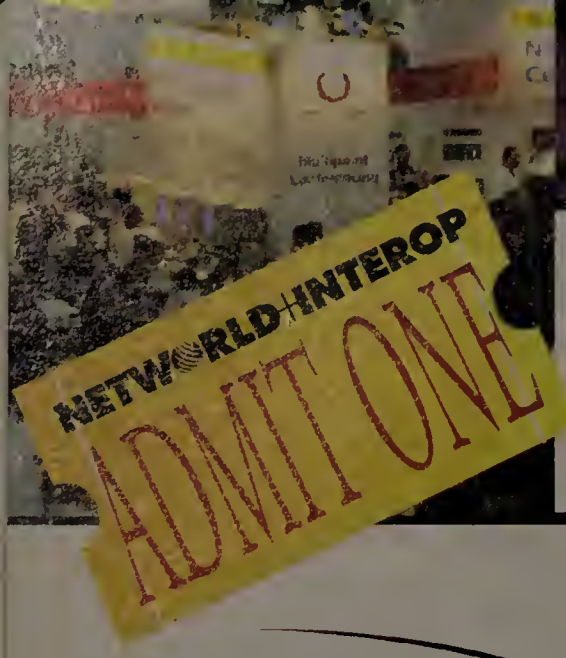

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BY JEFFREY FRITZ

Review

BEWARE THE QUICK DRAW

Design software can be one of the most valuable tools in the network architect's arsenal — provided it's accurate.

Network diagramming products are prone to evolution by natural selection. Simple drawing programs are losing shelf space to more sophisticated packages that include IP autodiscovery in their feature sets. This newest generation of network diagramming software can scan a network, determine its topology and draw a graphic depiction.

But don't expect 100% accuracy from these discovery features, which still have some evolving to do. None of the three network design packages we evaluated was able to identify all the components of our test network. The product that came closest was our Blue Ribbon winner, Visio Enterprise 5.0 from Visio, which performed the most comprehensive — albeit most time-consuming — network discovery. It also delivered the best user interface and topped its competitors' drawing capabilities and options for exchanging files with other applications.

Securing second place in our tests was NetFormx SE 3.5 from NetFormx. A solid performer, NetFormx makes it easy to create new objects to add to your network diagram and allows you to restrict the discovery process to particular areas of your network. However, we were disappointed with the product's sparse import and export capabilities.

Finally, NetSuite Professional Series 5.0 from NetSuite Development gets the job done, provided you work your way through a tedious installation and registration procedure. We weren't too impressed by the 5-minute discovery process we witnessed, which was unfortunately as incomplete as it was fast.

Net Results

Visio Enterprise 5.0

Visio Corporation
(800) 248-4746; www.visio.com/products/enterprise/index.html
$995

Pros

- ▲ Comprehensive drawing features
- ▲ Large library
- ▲ Most complete discovery of network
- ▲ Excellent import/export ability
- ▲ Graphic preview of library devices

Cons

- ▼ Discovery Wizard is difficult to find
- ▼ Connectors can cover text labels

NetFormx SE 3.5

NetFormx
(888) 743-6769; www.netformx.com/netformx.htm
$3,680

Pros

- ▲ Easy installation
- ▲ Selective discovery process
- ▲ Easy to create new device objects

Cons

- ▼ Printed documentation costs extra
- ▼ Weak and overly complex import/export ability
- ▼ User can not save data to preferred locations
- ▼ Reduces text font on edited objects

Netsuite Professional Series 5.0

NetSuite Development Corp.
(978) 318-5000; www.netsuite.com/cgi/template.pl/site/products/index.html
$2,995 plus $12 to $20 per SNMP node for NetSuite Professional Audit

Pros

- ▲ Library objects simulate actual device
- ▲ Links created and specified in single operation

Cons

- ▼ Complex installation and registration procedure
- ▼ Overly complex discovery process
- ▼ Creating new objects requires extra cost module
- ▼ Less detailed graphics

Not quite full disclosure

Before you start drawing, you need to take stock of the equipment on your network. An autodiscovery program can save you time. To find and identify the elements on your network, network diagramming software sends pings, SNMP gets, or a combination of the two. Reporting methods vary: Some programs distinguish routers, subnets and nodes in their discovery process; others simply report the number of devices and network segments discovered. The software then maps how the devices are connected.

To test proficiency, we let each package dig around on the West Virginia University enterprise network, which consists of an ATM backbone with four routers, and an FDDI backbone with eight routers. There are 159 subnets connected to the backbone network and more than 13,000 nodes.

None of these packages was able to discover our entire network. Not surprisingly, the fastest to complete the discovery process was the least accurate, and the slowest was the most accurate.

Visio Enterprise took its time mapping our network. We started the product's discovery process early in the afternoon, and it was still running seven hours later when the last of us went home. When we came in the next morning, Visio Enterprise was finished and had discovered 19 routers, 120 subnets, one FDDI ring and three token-ring networks. The router count was high because, without being told to do so, Visio Enterprise scanned and discovered devices on a neighboring network connected to our enterprise.

Launching Visio Enterprise's autodiscovery process isn't tough once you unearth the program's Advanced Discovery Agent, which is found three layers down in the menu hierarchy. We'd prefer to see Visio place this agent where it can be more easily accessed.

Visio Enterprise allows you to create multilayer diagrams using linked pages. Unfortunately, Visio Enterprise's discovery agent seemed unaware of this capability and placed all the discovered devices on a single layer of the drawing. This created an overwhelmingly complex diagram that was virtually unreadable. To reduce the clutter, we used Visio's Hyperlink function to create related drawings that allowed us to drill down into the network. Although not too taxing, the cutting and pasting we had to do to create the linked drawings was an unfortunate waste of time. It would help if Visio prompted users to request multilayer drawings before the program initiates the lengthy discovery process.

NetFormx discovered 12 routers, 71 subnets and 2,130 nodes in 1 hour and 35 minutes. Although it did not discover the complete network, that's a decent showing in a reasonable amount of time. We appreciated the level of user control that NetFormx builds into its discovery process, which is the most flexible of the three products' processes. You can opt to identify and draft the entire network, local subnets or a specific subnet, and you can choose to exclude subnets and devices from the scan process. This selective scanning feature is a real timesaver when you only need to deal with subsets of large enterprise networks.

Product: Visio Enterprise 5.0

Vendor: Visio Corp.

Visio Enterprise takes the guesswork out of diagramming with reliable autodiscovery and strong graphics.

The undisputed speed champ, NetSuite, completed its discovery process in less than 5 minutes. However, it identified only 39 segments on our enterprise and found the fewest number of devices. NetSuite limits its discovery process to 1,000 hosts, which left much of our test network undiscovered. Also, we found launching the process to be overly complicated. To run NetSuite discovery you must access the Professional Audit application, which is not included in the company's Advanced Professional Design module and costs extra. Once run, NetSuite's design module won't automatically create a design based on its discovery of the network. Instead, you have to execute multiple commands to transfer the discovered segments from the Audit module to the design module.

Information exchange

Though autodiscovery is helpful, it's obviously not your only source for network information. If you've created previous diagrams using another drawing package, you'll want to be able to import that data into

your new diagramming program. In addition, export capabilities will enable you to share discovery data with other packages, perhaps with more capable databases or more sophisticated graphics.

Visio Enterprise's import and export capabilities are the most comprehensive, followed by those of NetSuite (see graphic, below). NetSuite tops Visio Enterprise in one area: NetSuite can import device objects from database programs such as Microsoft's Access and FoxPro programs; it also can import from and export to Excel spreadsheet files.

Import and export functionality within NetFormx is very limited. You can import Visio projects and export network diagram elements to Excel to run simulations and perform network calculations, and that's about it.

Visio Enterprise's Connector tool does a decent job of connecting network devices. While Visio Enterprise takes great pains to avoid running connectors through other objects on the diagram, it makes no attempt to avoid text labels. Often you have to adjust the lines to avoid a messy diagram.

NetFormx offers a decent selection of drawing tools. You can drag devices from the browser window directly into the drawing window. A description of the device, which you can edit, appears below the device. We had one complaint: NetFormx inexplicably reduces the size of the text to about seven points when you're editing an object's text, making it extremely hard to read what you're typing.

If a device does not exist in the library that ships with NetFormx, you can create your own device by basing it on an existing object. If that isn't good enough, you can create a new library element from scratch. That can be handy for newly released devices that may not have made it into the library.

Curiously, NetFormx doesn't include a save command — databases and drawings are automatically saved as projects containing all the elements of the design, including the graphics and database entries. By default, NetFormx stores these projects on the same drive partition as the main program. While protective, this feature is also restrictive. NetFormx users are sophisticated enough to decide where and when to store files, and the application should give them that opportunity.

With NetSuite, you create designs in the Advanced Professional Design module. NetSuite's graphics are less detailed than the other packages' graphics, and devices are not drawn to scale. In addition, the library browser doesn't allow you to preview graphics. NetSuite claims that library elements are not just bitmaps, but detailed simulations that behave like the devices being modeled. The intent is to prevent the user from installing an unsupported card or protocol.

NetSuite's device library is not as comprehensive as that of Visio Enterprise or NetFormx. If you can't find the desired device, you can use a generic device. However, the generic ports and configuration may be different from those of the device you are trying to model. Alternatively, you can download additional devices from NetFormx's Web site. Otherwise you have to purchase the optional NetSuite Toolkit, which has a utility called Foundry that lets you create your own devices.

While Visio Enterprise and NetFormx allow you to link properties after you create the connection, NetSuite allows you to link while you are specifying the connection. You must select the first device to be connected, press F5, and then select the second device. This brings up the Create Connection dialog box, in which you reselect the devices and specify the connection type. At first this process seemed awkward, but the more we used it, the more we liked that it allowed us to specify and format a link in one operation.

ScoreCard	Discovery 30%	Drawing Capability 25%	Import/Export 25%	Installation 10%	Documentation 10%	Total score
Visio Enterprise 5.0	7 x .30 = 2.10	8 x .25 = 2.00	10 x .25 = 2.50	7 x .10 = 0.70	7 x .10 = 0.70	8.00
NetFormx SE 3.5	7 x .30 = 2.10	7 x .25 = 1.75	3 x .25 = 0.75	9 x .10 = 0.90	5 x .10 = 0.50	6.00
NetSuite Professional Series 5.0	4 x .30 = 1.20	6 x .25 = 1.50	7 x .25 = 1.75	5 x .10 = 0.50	6 x .10 = 0.60	5.55

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

Import/export capabilities

Supported file types	Visio Enterprise	NetFormx	NetSuite
Adobe Illustrator File Format (.ai)	✓		
AutoCAD file formats (.dwg, .dxf and .dwf)	✓		✓
CompuServe Interchange Format (.gif)	✓		
Encapsulated PostScript (.eps)	✓		
Joint Photographic Experts Group (.jpg)	✓		✓
Macintosh Picture File Format (.pct)	✓		
Microsoft Excel (.xls)		✓	✓
Tag Image File Format (.tif)	✓		✓
Text and Comma Separated Variable (.txt and .csv)	✓		✓
Visio projects (.vsd)	✓	✓	✓*
Windows Bitmap (.bmp and .dib)	✓		✓
Enhanced Windows Metafile (.emf)	✓		✓
Microsoft Access (.mdb)			✓
Microsoft FoxPro (.pjx)			✓

* Requires NetSuite Toolkit, which is sold separately.

Draw it up

Once your discovery is complete and the data imported, it's time to draw. But let's face it — network architects are rarely artists. When it comes to diagramming networks, they need intuitive, easy-to-use drawing tools and a comprehensive library of devices and network symbols.

Visio Enterprise offers extensive drawing capabilities, a large library and decent design tools. Using Visio's stencils, you can select specific network devices and drag them to your drawing. The stencil window offers a graphic preview of each device.

When you create a new graphic object, Visio Enterprise opens a dialog box that allows you to describe the device. Unfortunately, Visio Enterprise doesn't automatically add the device name to the drawing, so you have to label the device manually. The product automatically enlarges the device graphic and the text box, which makes entering device titles easier.

Up and running

Getting started with Visio Enterprise was tricky; the installer loads the complete custom installation — all 427M bytes — by default. We overrode the default choice and selected the "Typical" installation option, which installs the most commonly used components and claimed 145M bytes on our hard drive.

Installing NetFormx was a breeze. The typical installation will claim roughly 71M bytes on your hard drive.

Launching any of the NetSuite applications is a different story. You first need a license key that you must obtain from NetSuite's Web site by clicking through a series of screens and eventually entering the CD-ROM serial number, a registration ID generated by the program and address information. Once loaded, NetSuite's typical installation requires 82M bytes of hard drive space.

Documentation is critical if you plan to take advantage of the full capabilities of these complex design tools. Visio Enterprise's documentation is easy to read and helpful, but daunting. The company provides the 460-page *Developing Visio Solutions,* 203-page *Using Visio Enterprise,* and 258-page *Modeling in Visio Enterprise* guides.

Except for a printed 22-page NetFormx starter guide, NetFormx places all of its standard documentation on CD-ROM. A printed copy of the 297-page users guide is available, but it costs an extra $40. With a product this complex, we expect all documentation to be printed and included with the package.

NetSuite comes with three well-written volumes: a 162-page guide for the Professional Audit module; a 340-page guide for the Advanced Professional Design module; and a 212-page guide for the optional NetSuite Toolkit.

All in all, these diagramming packages will make life easier for network designers and improve the quality of network documentation. But make sure that you know the strengths and weakness of a package before you invest in its future.

Fritz is the principal network engineer for West Virginia University and author of Remote LAN Access: a guide for networkers and the rest of us, *and* Sensible ISDN Data Applications. *He can be reached at jfritz@wvu.edu*

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BY BARRY NANCE

Review

MAKING ELECTRONIC CUSTOMERS HAPPY

Talisma improves customer relations by managing e-customers' e-mail.

E-commerce means e-customers, and they mean e-mail — lots of it. While most companies' Web sites invite customers to send questions to sales@company.com and problems to support@company.com, they all too often do a poor job of handling customer e-mail interactions.

Start-up Aditi Corp. claims its Talisma product will help you get a handle on incoming e-mail and become more responsive to customers. Our tests show Aditi is on the right track.

We found Talisma to be an excellent customer service tool for managing up to 500 e-mail messages per day. A higher volume of messages, however, or concurrent use by more than 10 customer service representatives, tend to slow Talisma's performance. This scalability problem was the major reason it received only an average score on our ScoreCard.

Net Results

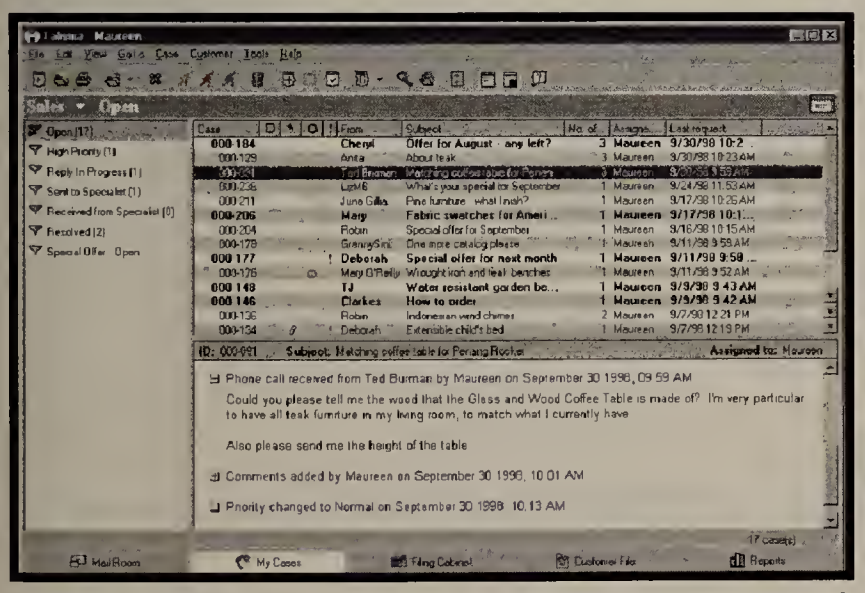
Talisma 1.0
Aditi Corp.
(425) 897-2900, www.aditi.com
$2,995 per seat

Pros
- ▲ Well-thought-out design
- ▲ Good customer import/export capability

Cons
- ▼ Pricey
- ▼ Supports only 10 concurrent users without performance degradation

Talisma is a cross between an automated inbound e-mail router and a help desk application. It turns incoming customer e-mail into cases that you can track, categorize and respond to. The product's level of control over customer e-mail exchanges is its most impressive feature.

Talisma consists of a mail server, a client interface and database components. The server accepts Microsoft Exchange or SMTP/POP3 mail and can distribute it to the next available customer service representative, the representative with the smallest case load, or the representative who last answered mail from the sender.



Talisma's three-pane interface makes it easy to categorize customers and zoom in on their histories.

The client interface is a Windows application that looks and behaves somewhat like Microsoft Outlook. Unlike Outlook, however, all customer service representatives and e-salespeople share a common in-basket of customer queries and customer data.

Giving ownership of a customer to a service representative and assigning each e-mail message to multiple categories are easy tasks. We used Talisma to not only keep track of unanswered e-mail but also prioritize queries and customers. We especially liked the product's ability to forward a query to a specialist without losing control over the query.

For simple queries, we told Talisma to emit canned responses that we had authored. Its single built-in canned response is a basic message telling a customer his or her query has been received and is being worked on. But Talisma has excellent tools for building a library of custom responses.

The client interface gave us a variety of ways of looking at our simulated workload. A customer representative can click the Mail Room button to see a list of all customer representatives' cases (e-mail queries), then can click on My Cases to see just the cases assigned to him or her. The Filing Cabinet button lets representatives search cases and customers in an ad hoc manner. For administrators, Talisma includes a display-only browser-based management tool for viewing customer service activity from a remote site.

Talisma uses a Microsoft Access database file as the database component for e-mail and customer data storage, which explains its inability to support more than about 10 users. For scalability, Talisma sorely needs an Open Database Connectivity interface to a relational database management system such as SQL Server or Oracle. On the plus side, we found that extracting data via either Microsoft Access or Excel is easy and painless. Additionally, Talisma offers a simple-to-understand, scriptable programming interface for importing or exporting customer data.

The product's monitoring and analysis features are highly useful. We measured the productivity of our simulated customer service team using Talisma's graphs and reports. Among other things, it showed us the number of responses sent by each customer service representative in a specified time period, and separately identified first-time and follow-up responses.

ScoreCard

	Talisma
Performance 25%	9 x .25 = 2.25
Manageability 25%	8 x .25 = 2.00
Scalability 25%	5 x .25 = 1.25
Documentation 15%	6 x .15 = 0.90
Installation 10%	8 x .10 = 0.80
Total score	7.20

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

We were impressed with Talisma as a tool for small to medium-size organizations. Customers want your immediate, informed attention, and Talisma makes sure you provide exactly that. If Aditi can solve its scalability problems by using an enterprise database back end, it could be a useful tool for organizations of all sizes.

Nance, a computer analyst and consultant for 28 years, is the author of Introduction to Networking, 4th Edition *(Que, 1997) and* Client/Server LAN Programming *(Que, 1994). You can reach him at barryn@erols.com.*

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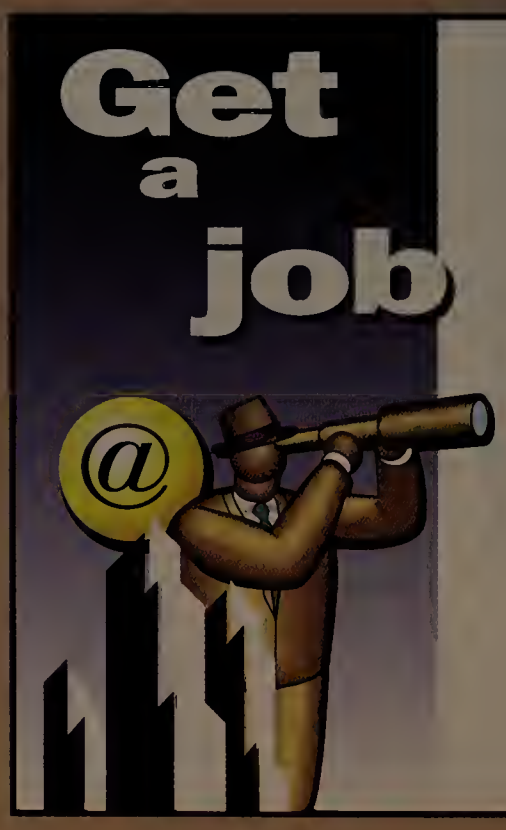

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Taming the trade show beast

Trade show guru Steve Miller says attending conferences is hard work.

Veteran conference attendees offer their tips and tricks for making the trip worthwhile.

BY PAUL MCNAMARA

Here's the only sure-fire way to guarantee that a trade show won't waste your time and your company's money: Stay home.

A tempting thought, perhaps, especially if the show is fall Comdex. But simple avoidance isn't an option for most network professionals, so *Network World* got trade show warriors to divulge their best tips for making the most of the madness that can engulf an event such as next week's NetWorld+Interop 99 show in Las Vegas.

According to our experts, here's dirty little secret No. 1 about trade shows: They're hard work, at least if you take your job — and the trip — seriously.

"People think that trade shows are just fun and parties, whereas anyone who works one the way they are supposed to needs a vacation after the trip," says Steve Miller, a trade show consultant and author of the book, *How to Get the Most Out of Trade Shows.*

Former Boy Scouts make productive attendees, the experts agree. In other words, be prepared. Set specific, quantifiable objectives well before the show, because a plan to "check out all the new stuff" is no plan at all when you're facing hundreds or even thousands of vendors.

"Go at it from a problem/solution perspective," Miller says. "What are the problems you want to solve or what are the areas that you need to learn more about?"

This means not only knowing what you need to get done but what your boss wants accomplished.

Scott Wenzel takes this trade show stuff seriously, but he's also armed with a sense of humor. Wenzel last year posted an "Unofficial Lotusphere '99" Web site that acted as a clearinghouse and sounding board for those who attend Lotus' perennially sold-out customer conference in Orlando.

"Approach a big show the same way you'd approach a marathon," says Wenzel, who by day is a Lotus Notes guru at the Social Security Administration office in Baltimore. "The parallel is remarkable, down to the people standing there handing you drinks, most of which get spilled." He could have mentioned sneakers, too, which every expert recommends as the proper trade-show footwear.

Here are Wenzel's favorite three tips:

- The best information and connections are never on the official agenda but are found instead at social and "birds of a feather" gatherings.
- No trade show is worth sacrificing your health or sanity, so take breaks.
- Time spent in your hotel room is time wasted.

It's also easy to waste time on the show floor, particularly at the mega-shows, where marketing buzz and glitzy presentations tend to overwhelm the technical information.

"Too often attendees let the exhibitors control their time," Miller says. "When you get in the booth, start nailing them with questions, and, if they are not giving you the answers you need, get out."

When you do find a fountain of wisdom, consider inviting that person along to a show party or to dinner, suggests Steve Begley, president of a San Francisco-based media and trade show consultancy.

Begley believes the key to getting good information is pushing the right buttons. He says many vendors have to drag their technical experts onto the show floor, and these people dread having to regurgitate the company's marketing line. Give the geeks a challenging real-life problem to solve, however, and they're much more likely "to go off the script and answer your question."

Guarding your time extends beyond the trade show itself, says Chris Miller, senior systems manager at Catalyst Solutions Group in St. Louis.

Beware of people who ask if they can swipe your trade show badge to record your contact information, Miller cautions. "There's nothing worse than having every salesman you meet calling over the next six months."

And then there are network executives who do believe that staying home is often the best strategy.

Walter Fletcher, IS manager at Lipscom & Pitts Insurance in Memphis, sees trade shows as "a waste of time," unless his company has a specific project in the works that demands immediate reconnaissance.

"Conferences today are no good for [routine] fact-finding missions," he maintains. "The Internet is better." ◪

The secrets of successful showgoers

Do's

- Consult with supervisors beforehand to agree on objectives.
- Make appointments with vendors.
- Attend birds of a feather sessions to augment formal show offerings.
- Meet at least daily with co workers to maximize show coverage and avoid duplication.
- Send regular reports back to the office so they know you're working.

Don'ts

- Waste time watching videotaped marketing presentations.
- Ignore the outskirts of the show floor, as that's where the real gems may be found.
- Be shy about asking to speak to someone else if you're not getting the right answers.
- Give your contact information to every salesperson.
- Forget extra batteries for your PalmPilot and tape recorder.

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ASIC Verification Engineer - 3-5 years of applicable verification of large ASICS is a must. In this position, you must have Verilog PLI programming experience as well as experience with Verilog HOL modeling and use with Chronologic VCS. In addition, you'll need to know C/C++ and Perl programming. Experience in UNIX and experience writing test vector generation and ASIC functional verification tools are also mandatory. Direct experience with embedded processors is highly desired.

Sr. Analog Engineer - In this position, you will need 5 years in several but not all areas of expertise. Should be familiar with CMOS analog, high speed IO (LVDS or PECL), PLL's (low jitter high frequency) high speed ram design. Experience with Phase Aligners. Should have the ability to lead a project from inception to lab verification.

All above positions require BSEE; MSEE a plus.
Above three positions: Dept. Code: CKEHE

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MARKETING

Director of Product Management - You'll lead technical market requirement direction by interfacing daily with our Hardware, Software and Test Engineering Organization. Defining market opportunities, business case analysis and technical requirements, you'll drive all aspects of the entire project, ensuring that deadlines are met. In addition, you'll lead a cross-company function to include input from Engineering, Marketing, Manufacturing, General Operations and Customer Support. Qualifications include engineering experience and product management background or project engineering experience; 5-10 years' experience in the semiconductor industry is a must. You must have knowledge of networking (Enterprise and PSDN) and OEM design scenarios/requirements. BSEE, MBA, networking industry background and knowledge of large chip design are pluses. **Dept. Code: WAMDPD**

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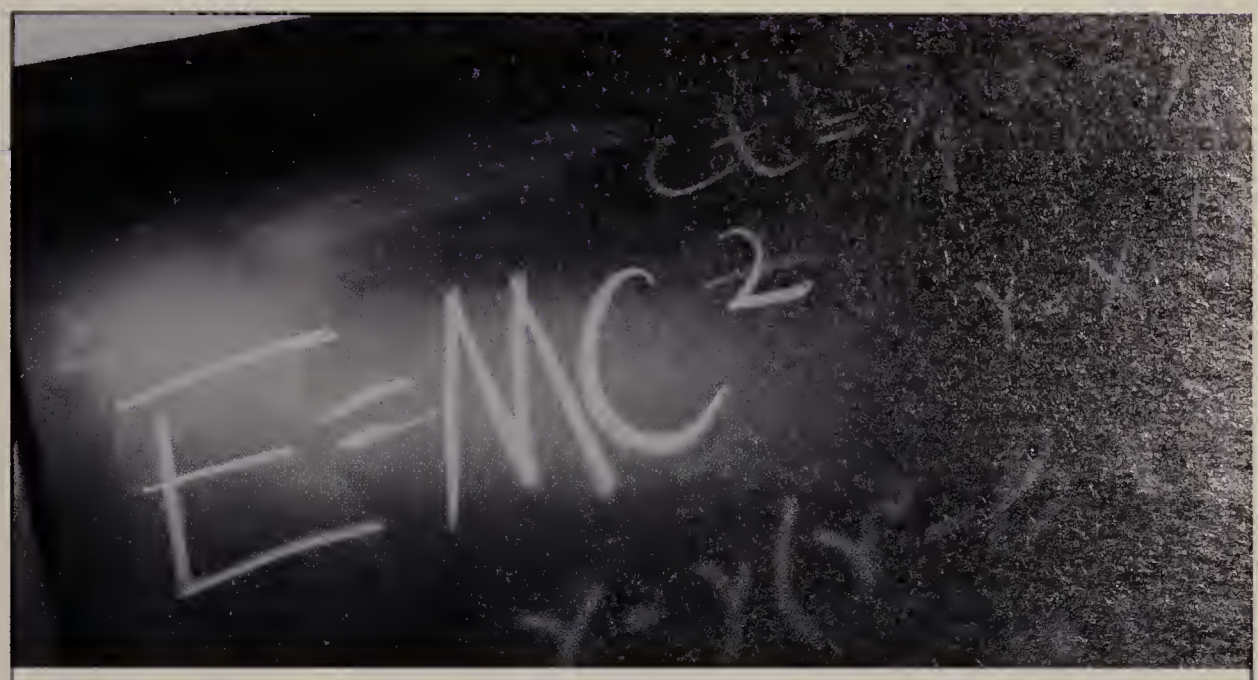

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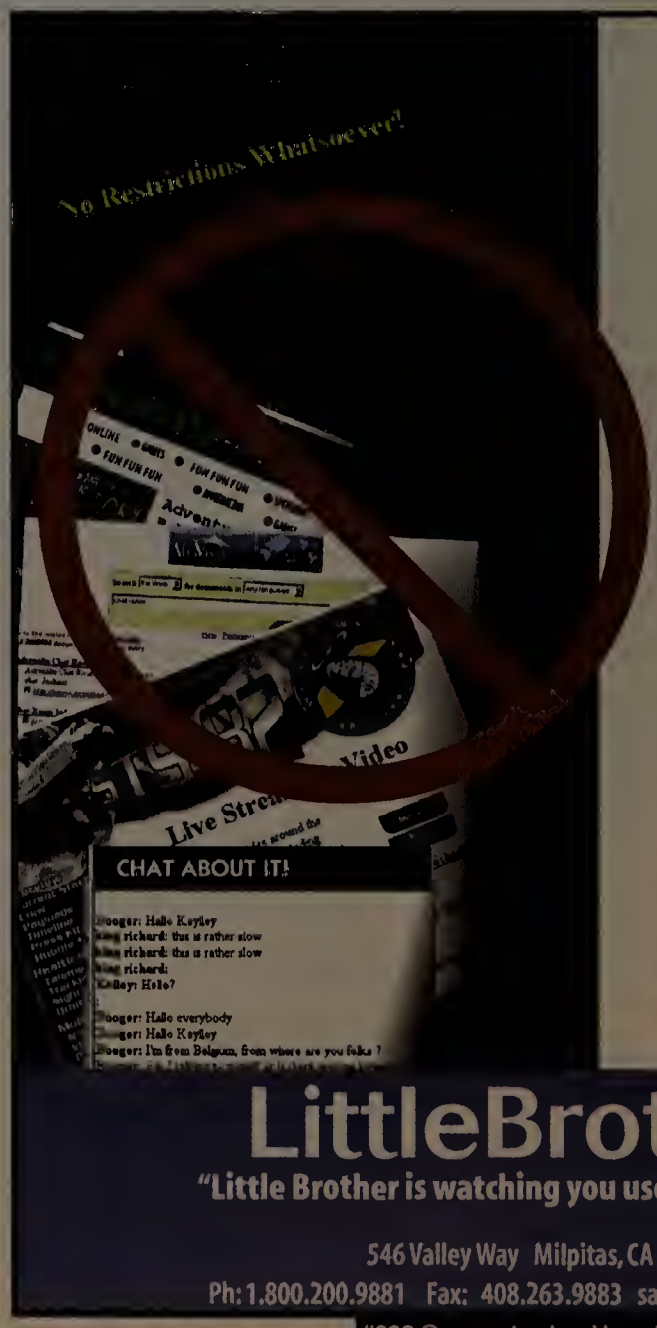

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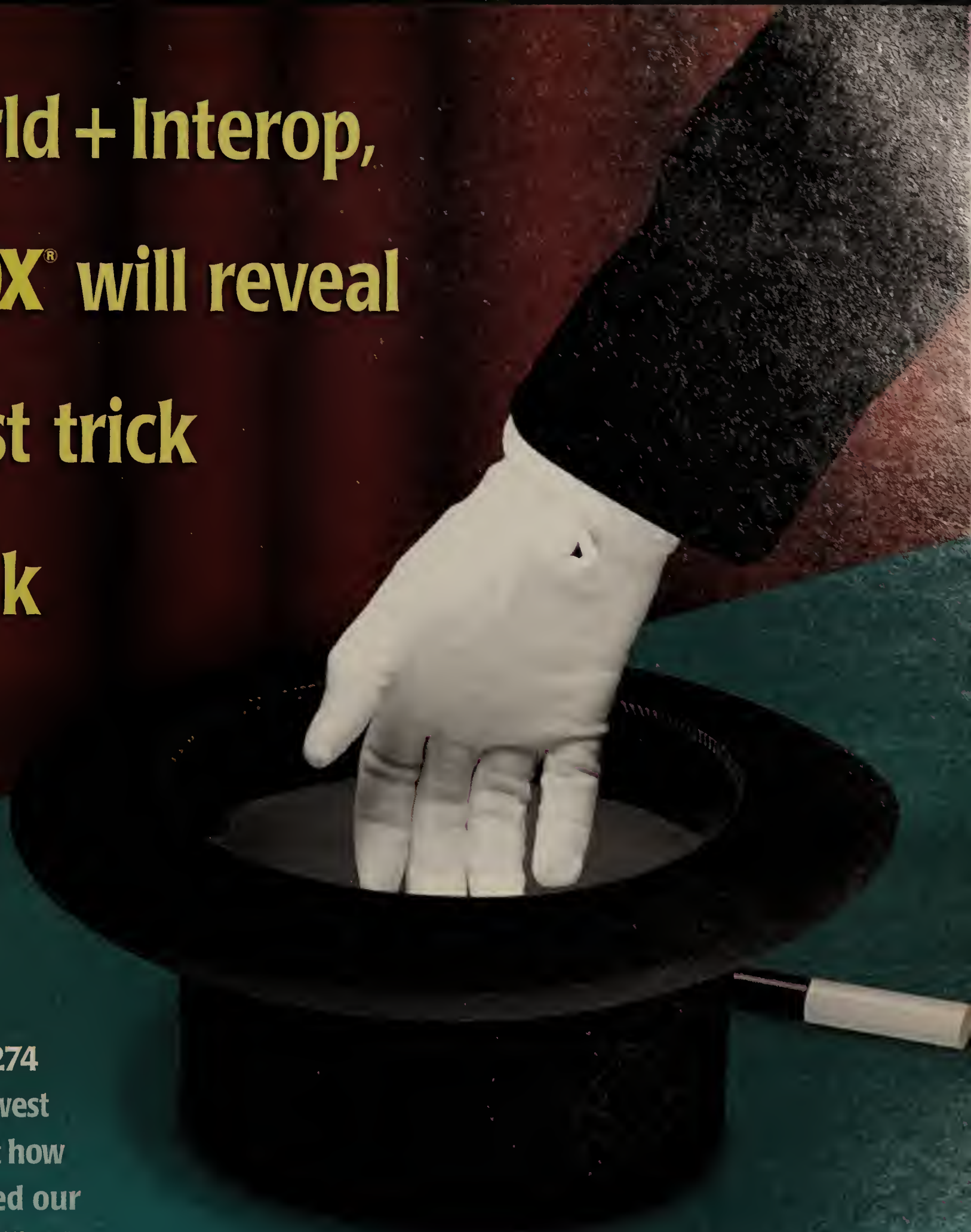

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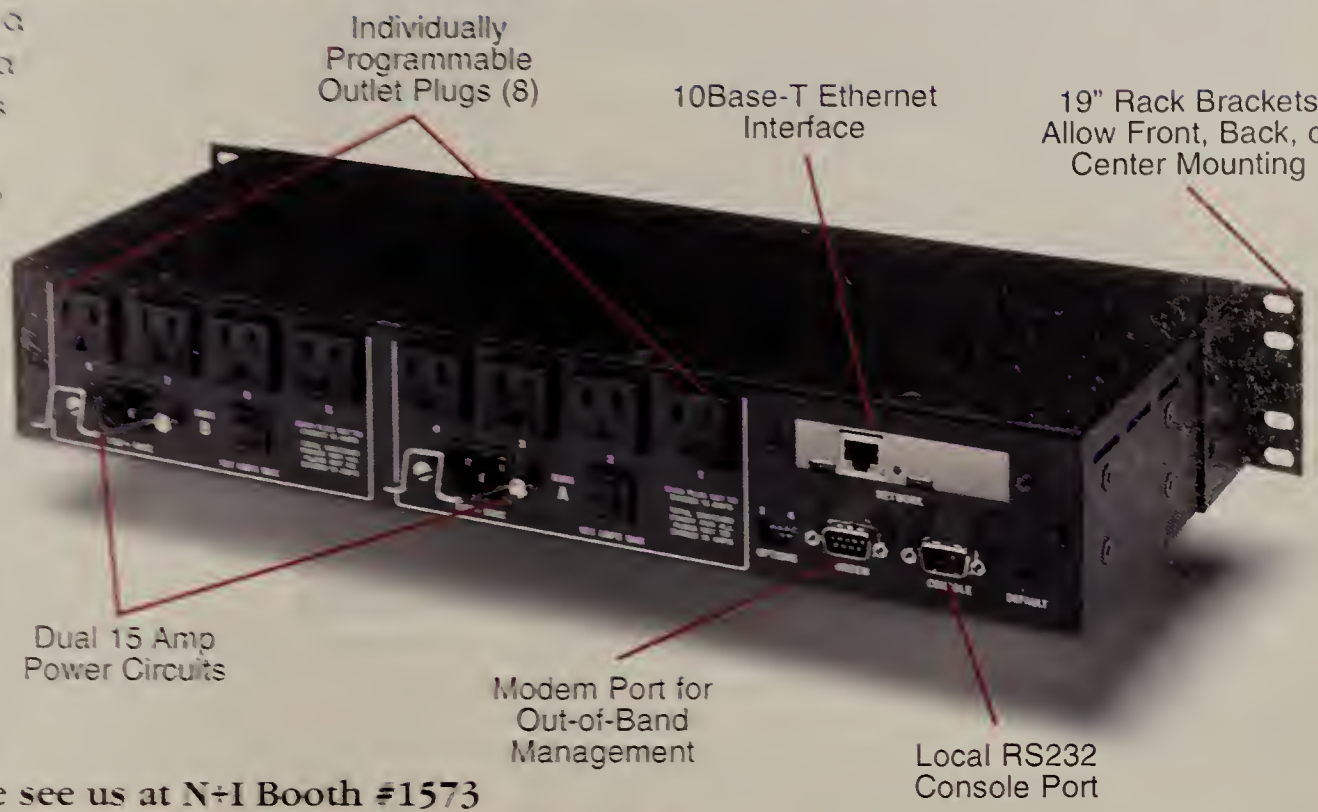

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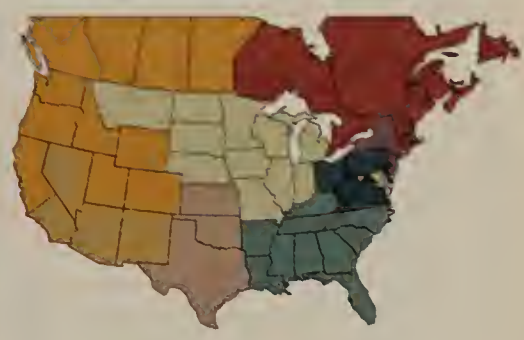

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Cisco,
continued from page 1

The switch was supposed to go into field trials last year and ship this year. Cisco will now offer its MGX 8850, which is currently positioned as a service provider edge switch, for the WAN core, says Don Proctor, director of marketing for Cisco's Multiservice Switching business unit.

Cisco has also delayed shipment of the IGX 8450, a WAN switch that also combines IP and ATM switching for enterprise data, voice and video integration.

The IGX 8450 was supposed to ship in the fourth quarter of 1998 but won't be available until this fall, Proctor says (*NW,* Oct. 5, 1998, page 12).

> ***"It proved very difficult to produce one switch that would meet the enterprise customer's unique needs and the service provider's unique needs at the price they expect."***
>
> Don Proctor, director of marketing, Cisco's Multiservice Switching business unit

Analysts say Cisco could forfeit WAN business to rivals Ascend and Newbridge Networks, as well as to the high-speed router start-ups.

"Wow," says Scott Heritage of investment firm Warburg Dillon Read in New York when told of the fate of the TGX 8750. "That's not a good sign. The product looked very promising on the drawing board, and I was quite optimistic about it. Obviously, they've been having problems."

"Killing a product like that is significant because that whole announcement as I recall [positioned Cisco] far and away ahead of Ascend," says Rosemary Cochran of market researcher Vertical Systems Group in Dedham, Mass.

"Very interesting," says Joe Skorupa of consultancy Ryan, Hankin, Kent in San Francisco. "I'm not surprised about the 8750. We never thought it was a serious player at the core."

The TGX 8750 was a 20G bit/sec optical core switch intended to deliver broadband IP and ATM services using Cisco's Tag Switching and the Internet Engineering Task Force's Multiprotocol Label Switching technologies.

Cisco designed the TGX 8750 to let users scale routing to terabit speeds and to bring OC-48c switching to the core "at a price that leads the industry," according to a Cisco press release — $60,000 per OC-48c switch and $45,000 for channelized OC-48.

Proctor says Cisco killed the switch because the company couldn't build the product to come in at those promised prices.

"It proved very difficult to produce one switch that would meet the enterprise customer's unique needs and the service provider's unique needs at the price they expect," Proctor says.

He adds that Cisco's MGX 8850 has more than enough capacity, density and features to fulfill both the core and network edge roles in service provider and enterprise networks.

Cisco delayed the IGX 8450 because it wants to add voice and virtual trunking capabilities to the switch. The IGX 8450 is a 3.2G bit/sec IP and ATM switch that connects LANs, legacy data, PBXs and video codecs across private WANs.

The delay will not likely impact IGX user Fleet Technology Solutions of Albany, N.Y., the IT division of banking giant Fleet Financial Group in Boston.

Cisco's MGX 8850 will replace the TGX 8750 in the core.

"We've gone through several reorganizations which have realigned certain resources as well," says Thomas Ryan, assistant vice president at Fleet Technology Solutions. "We've postponed the integration to a broadband core."

Ryan says he expects to resume that integration and receive shipment of the IGX 8450 in six months. ◪

Showdown,
continued from page 1

Operating System Showdown. The presidential-style, take-no-prisoners debate is sure to provide insights not typically found in vendor white papers.

In all likelihood, there will be more than free T-shirts at this event. With the recent surge in interest in Linux, the resurgence of Novell and the release of the third Windows 2000 beta, there should be enough fodder for a verbal rumble.

Net administrators are loading up their questions, including those that cover integration, strengths and weaknesses of each system, total cost of ownership, standards and API support, uptime benchmarks and security.

Jean-Marie Chanoine, a senior software developer for Framework, in Tarrytown, N.Y., wants to know what the vendors are doing to improve total cost of ownership, including costs for staff, hardware and software, and how the costs stack up against the competition.

Arthur Bommele, a senior system engineer for a consulting firm in the Netherlands, believes no single vendor is capable of solving every operating system issue a customer encounters. So he wants to know what vendors are doing to facilitate integration in multisystem environments.

A host of network administrators submitted questions to *Network World.* They are inquiring about operating system support for such things as TCP/IP, Lightweight Directory Access Protocol, Common Object Request Broker Architecture, Extensible Markup Language, HTML and management protocols, such as SNMP. And some administrators wonder about whether operating system APIs are open or proprietary. They also raised questions about the kind of work vendors are doing to improve APIs.

Another area of concern centers on how operating systems scale and what sort of reliability users can expect once that threshold is met. Given that the operating system software is the lifeblood of the network, and the network is becoming the lifeblood of most major corporations, administrators care deeply about what is being done to ensure uptime.

Security also is a major concern. One network administrator who requested anonymity wants to know if vendors have a fully secure operating system equivalent to or better than B1, the security level required on systems at the U.S. Department of Defense. On top of that, the administrator wants to know if vendors are willing to disclose source code to a trusted third party to verify security claims.

And what about management? How good are the tools that vendors provide, and how good are the third-party tools?

Then there are the inevitable bugs. How long do vendors sit on bug reports before releasing information and patches?

With all these questions, the vendor representatives are likely to give net administrators the kind of information needed to decide which operating system is best for which environments.

The debate will be moderated by John Gallant, *Network World's* editor in chief. Firing questions at the vendor participants (see graphic) will be Network World Test Alliance Director Christine Burns and Nick Petreley, editorial director of *Linux World.* ◪

Showdown lowdown

NetworkWorld SHOWDOWN Operating Systems

When: Tuesday, May 11, 10:30 to noon

Where: NetWorld+Interop 99, Las Vegas Convention Center, Room N246

Participants: Tanya van Dam, group product manager for Windows NT Server, Microsoft; **Drew Major,** chief scientist, Novell; **Richard Green,** vice president of the Solaris product line, Sun Microsystems; **Tamar Newberger,** director of server product marketing, The Santa Cruz Operation; **Erik Troan,** director of engineering, Red Hat Software

Panel members: Christine Burns, Test Alliance director, *Network World;* **Nick Petreley,** editorial director, *Linux World*

Moderator: John Gallant, editor in chief, *Network World*

Network World, 161 Worcester Road, Framingham, Mass. 01701-9172, (508) 875-6400

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Net Bowl Participants

- **Eric Wolford** — AT&T
- **Mike Skubisz** — Cabletron Systems
- **Matt McConnell** — Compatible Systems
- **Karyn Mashima** — Lucent Technologies
- **Mark Gibbs** — *Network World*
- **Howard Anderson** — The Yankee Group

- **Janice Roberts** — 3Com
- **Clyde Jenkins** — ADC Kentrox
- **Larry Lang** — Cisco Systems, Inc
- **Gordon Stitt** — Extreme Networks
- **Phyllis McCullagh** — Gateway
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Backspin

Blaming the business

Take your life in your own hands and what happens? A terrible thing: no one to blame.

— Erica Jong

MARK GIBBS

I was driving around with my father-in-law yesterday and on my favorite NPR radio station I heard an item about the recent tragedy at Columbine High School in Littleton, Colo. Guess what is being highlighted as a contributory factor in the actions of the murderers? Computer games.

Apparently the two teenage gunmen, Eric Harris and Dylan Klebold, were avid Doom and Quake players.

Just in case you haven't heard of these games (I can't imagine how that is possible unless you are one of our readers in Sumatra or the Trobriand Islands), these are hugely popular, first-person, shoot-'em-up games.

The key points here are that they are first-person games — the action is seen from your viewpoint — and they are extremely violent. Your weapons consist of various powerful guns and chain saws. Pretty nasty.

Once upon a score of Internet years ago these were stand-alone games. But over the succeeding virtual decades they have acquired Internet connectivity. Now you can slaughter people on the other side of the planet.

The radio program discussed this topic at some length, bringing in commentary from a number of experts, including a retired military gentleman who pointed out that Doom is used to train Marines. He seemed to be against such programs for public consumption.

I started to look for information on this issue and discovered that 25 entities — including Nintendo of America, Sega of America and Sony Computer Entertainment — are already being taken to court in another murder case.

That case is being brought by the families of three students at Heath High School in West Paducah, Ky., who were killed by Michael Carneal, a 14-year-old gunman, in December 1997. The damage suit for $130 million was filed last week and maintains that the defendants' products influenced Carneal's behavior.

According to Reuters, the suit claims: "Computer games [and] two Internet-related operations . . . trained Carneal to point and shoot a gun in a fashion making him an . . . effective killer without teaching him any of the constraints or responsibilities needed to inhibit such a killing capacity."

This is ridiculous. I could understand going after Carneal's parents — but computer games makers? That's like trying to sue Chevron for contributing to a car accident.

What concerns me is the trend towards blaming our social ills on computers and the Internet. The usual complaint is they have some profound corrupting influence.

<digression>Just today my wife told me she heard some people on the radio complaining about clicking on a link and winding up at a pornography site. Their conclusion was, of course, that legislation is required. What dolts. Might I suggest that it is their responsibility to check out where they are going before they follow the link? Would they just randomly open a magazine on a newsstand without thinking about what they may hold?</digression>

The problem, folks, is not computers, computer games, or the Internet — it is us, it is our society. It is our neglect of our children and our unwillingness to take responsibility for our actions and duties.

I defy anyone to show solid evidence that someone who is effectively rational could be turned into a killer by a computer game or something they read or saw on the Internet. All the evidence so far indicates that Carneal, Harris and Klebold were not too tightly wrapped to begin with.

If the action against Nintendo, Sega, et al., is won, God help the computer business.

Games theories to nwcolumn@gibbs.com.

'NET BUZZ

PAUL MCNAMARA

Never mind the pornographers, how's this for peddling flesh on the Web?

A group of 16 IT professionals — whose spokesman swears the group was not joking — last week offered its services en masse to the highest bidder on an eBay auction listing. The group's asking price: a cool $3,140,000 in signing bonuses and salaries.

Known only by the moniker "ispteam," this collection of ready-to-go geeks works today for a Silicon Valley ISP that the group will not name. The IT professionals declared themselves free agents because, "for the last four months, everyone around here has pretty much had it" with upper management, says the spokesman, a 23-year-old senior engineer.

"We work together as a team, and it would be terrible to break it up," he says. Included in the group are a director, two managers, three engineers, five administrators and various others.

"It might be the start of a whole new trend," says Kevin Pursglove, senior director for communications at eBay.

Funny stuff, but who would actually hire an IT staff this way?

"We've had some serious bidders," Mr. ispteam claims. "I can't tell you names, but you could probably guess the e-commerce sites." The auction was closed Friday.

I'd say stranger things have happened, if not for the fear that someone would want an example.

Theft of intellectual property is nothing new on the 'Net, but ripping off an entire Web site? . . . That's grand larceny.

Blue Sky Communications, a London-based Web design company and Lotus business partner, was stunned recently when one of its employees stumbled upon the site of Control Web, a previously unknown competitor/start-up in Cincinnati.

"In effect, they took all of our graphics, the site navigation and all of the text describing both our company and products," says Blue Sky Marketing Manager Matthew Winwood. The company simply substituted Control Web for Blue Sky where necessary, he says.

Control Web even appropriated a testimonial quote from an IBM executive that Blue Sky had posted, attached a fictitious name to the blurb, and claimed the kudos as its own.

"Our first reaction was sheer disbelief at the nerve of these people," Winwood says. Blue Sky's second reaction was to demand that the site be removed. And though Control Web complied, Blue Sky's third reaction may involve lawyers.

So why would anyone swipe a Web site?

We contacted William Metz, a Control Web principal, but as you might expect, he declined to be interviewed. "We regret this incident," Metz did say in a written reply to Blue Sky. "It represents an unfortunate mistake by an individual and does not reflect the attitude or ethics of everyone associated with Control Web."

That's not exactly a satisfying answer, but maybe Blue Sky can take solace in that old bromide about imitation and flattery.

Here's one from the Technology We Don't Need Department: WolfeTech Corp. of Claremont, Calif., faxed us a press release touting the addition of a feature called FlowerShop to its PocketGenie software. The "upgrade" allows users who are so busy they don't have time for a lousy phone call to order flowers for their honeys via two-way pagers.

Wake up and smell the petunias, people. We're getting way too carried away with this convenience kick. Besides, I can just imagine the reaction of Mrs. Buzz were she to learn that the sum total of my effort to mark our upcoming wedding anniversary was to punch in a page.

McNamara would rather carry rabies than a pager, but you may send him your Internet-related news tips via the communications device of your choice. Contact him at (508) 820-7471 or pmcnamara@nuw.com.

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